

# A REPORT ON UNIVERSITY-INDUSTRY SYMBIOSIS: A DETAILED INSIGHT INTO CENTURION UNIVERSITY

# 2022



**Centurion  
UNIVERSITY**  
*Shaping Lives...  
Empowering Communities...*

## CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT

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# The Context



**India's new Solar Power Tree takes up only 4 square feet and produces enough energy to light five houses.**

In a finite world, economic growth, consumption and production cannot be infinite. The climate change, environmental disaster and depletion of water and food availability across the globe is more a routine now rather than an aberration.

Every human has no option but to be productive and add more value than what he/she consumes. 'Productive' means believing and acting on "Mini Max" model, i.e., using minimum resources for maximum output and consuming as little as possible. That is only possible when the citizenry, especially youth, think and act productive. To accomplish this, education institutions in general and universities in particular have to play a quantifiable, active, time sensitive and leadership role in shaping, developing and nurturing future productive citizens, which is a Herculean responsibility. This can only be possible with partnerships with industries, civil society organizations and Government for institutional knowledge and skill acquisition and alleviation in addition to inherent and intrinsic expertise and competency.

This report is about the University-Industry symbiosis in the scenario of specific contextuality of Centurion University. The DNA

of Centurion University has been and shall remain to design, develop and deliver hands-on knowledge, experiential learning and production-linked pedagogy in an inclusive environment which connects to Mother Earth and the Ecology.

The University has carved, crafted and created a pathway model in partnership with NIOS (Ministry of Education) / DGET/ DGT (Ministry of Skill Development and Entrepreneurship). To cite an example, a 10th pass student can secure +2, 1-year ToT (Trained Teacher Certification), 2-years ITI and Diploma in 3 years, or BTech with Diploma, ITI, Trained Teacher Certificate from DGT & +2 from NIOS in 6 years after 10th.

The country and world in entirety have to fastforward to embrace competency-based education instead of certificate-linked degrees not as a policy or philosophy, but in practice and action. NEP is crystal clear, and the intent of the Government is rock solid to navigate this paradigm but the education eco-system needs to gear up and the awareness for the new age teaching and learning needs to be institutionalised.

Centurion University, within its limitations, has nurtured, nourished and traversed Industry-University symbiotic relationship for appropriate, relevant, concurrent, and meaningful education. This report allows a glimpse on the model in action, which is in tandem with the NEP and corroborates with the need-of-the-time.

*M.K. Mishra*

**Prof. Mukti Kanta Mishra**

President

Centurion University of Technology & Management





## About the University

Centurion University is duly recognized as a pioneer in “Skill Integrated Higher Education”. Its unique model lays specific emphasis on creating sustainable livelihoods on a national scale in challenging geographies through education that results in employability and sparks entrepreneurship. This model has been recognized by several Governments and International Organizations such as UNESCO, the World Bank and National Level Policy Think-tanks such as the NITI Ayog. Recently, Centurion University’s School of Vocational Education and Training has been recognized as a Center of Excellence by Ministry of Skill Development and Entrepreneurship, Government of India. It is the only University in India to be recognized as such.

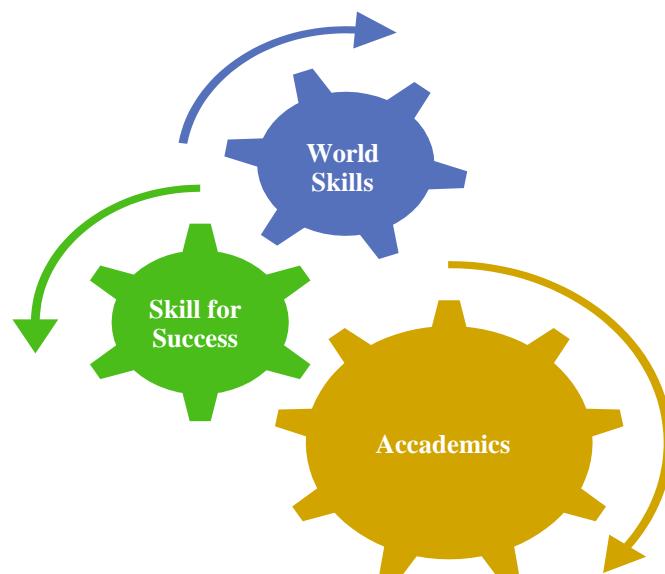




# The University's Academic Model

Centurion University of Technology and Management (CUTM) [Referred to as The University] is one of the leading notified Skill Universities of India. Its unique model lays specific emphasis, besides delivering appropriate and relevant skills integrated higher education, on creating sustainable livelihoods in challenging geographies and rural demographics through education that results in boosting employability, promoting entrepreneurship and linking to gainful employment. This model has been acknowledged and applauded by the Government of Odisha and Government of India Policy Think-tanks such as the NITI Aayog, as well as many leading international organizations such as the United Nations, UNESCO, World Bank, and British Council among others.

Centurion University has been notified as a “Centre of Excellence” by the Ministry of Skill Development and Entrepreneurship (MSDE), Government of India. The education model that Centurion University follows domain specific industry linked delivery structure and continuous evaluation process. It imparts a real time experiential learning and practical exposure to students endeavouring to inculcate a spirit of scientific temper, boosting self-confidence and kindling entrepreneurial spirit. The curricula allow learning according to their interest through “Skills for Success” which offers the students a platform to pursue a skill course of their interest, not necessarily from their specialization. For example, depending on their interest, students of Management or Commerce streams could get skilled in Robotic Welding/ precision manufacturing. The courses are aligned according to National Skill Qualification Framework (NSQF) to make students industry ready with additional NSQF mapped domain specific assessment and certifications.



*University's Skill integrated Accademics and its Manifestations*

# Importance of University-Industry Collaborations (U-I)

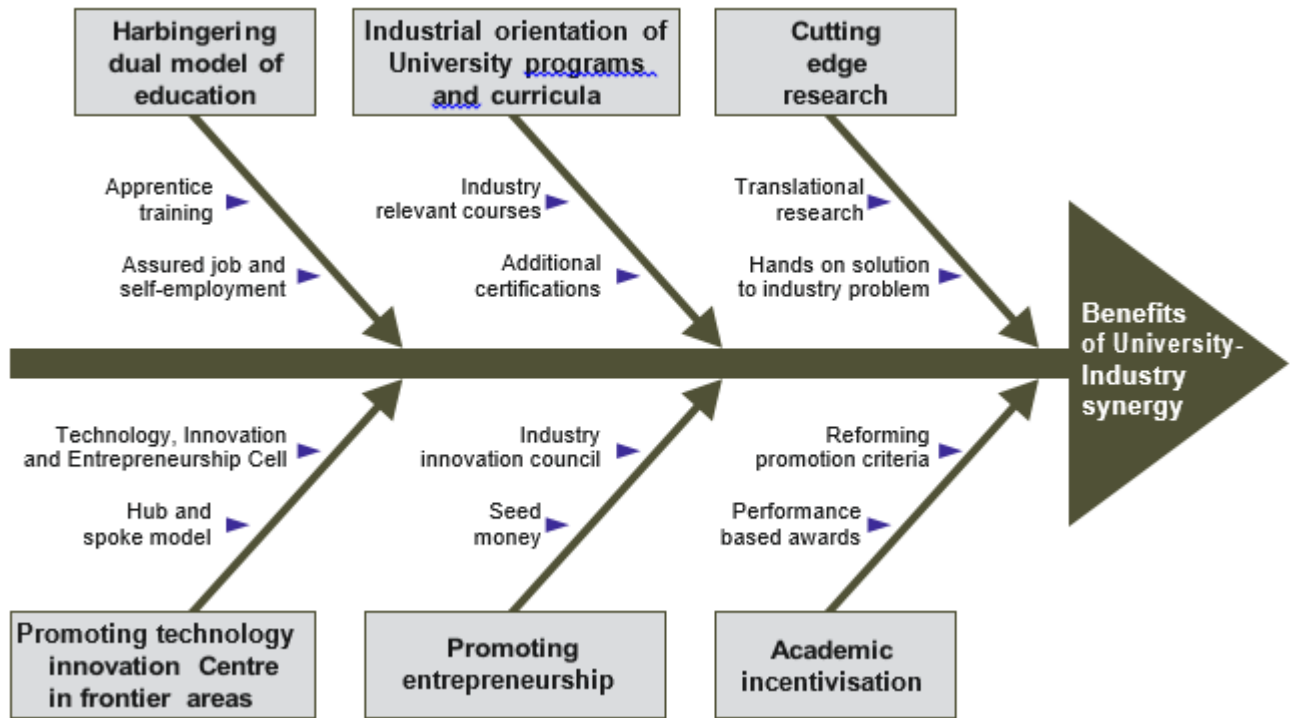
India is home to World's oldest universities and based on the concept of the Gurukuls which were used to impart knowledge of arts and science from time immemorial. The modern world education model of our country was centred on producing manpower in tandem to Industrial Revolution and Macaulay Minutes until the National Education Policy (NEP) 2020. The NEP has induced a major shift from the previous forms of education models, by integrating skill into higher education with multiple entry and exit points. It is noteworthy to mention here that the university's charter has adapted this framework long ago, right since the enactment of The University Act 2010. Besides skill integration the industry academia synergy was inculcated in letter and spirit. The first MoU was signed with Ashok Leyland a lead automotive company in the year 2010 for setting up of facilities by them and joint delivery of practical and theory classes by having their master trainers positioned in the campus. colfacilityoration.

University-Industry collaborations is a perfect model and growth enabler in tandem to different Sustainable Development Goals. It has been recognized as the key to promote innovation ecosystem as espoused in SDG 9 which is further corroborated by SDG 10. These validations deliver far reaching and enduring socio- economic impact that cannot be achieved by working in silos. U-I synergy further enables the Universities, to carry out cutting edge research which includes scale-up studies and commercial-ization of their knowledge base.

Industries, especially the financially compromised ones, look towards Higher Education Institutions for assisting in their R & D efforts to maintain competitiveness. Besides, faculty members and students get an exposure to work on real-life scenarios, which are termed as 'active translational research' and action learning. U-I synergy in a nutshell aid to

- a. Introduce dual model of education
- b. Industrial Reorientation of University Programmes and Curricula
- c. Cutting edge research
- d. Promoting technology innovation centre in frontier areas
- e. Promoting entrepreneurship
- f. Academic incentivisation





*Benefits of University Industry Synergy*

## Introducing dual model of education

The dual model of education is defined as integrating class room-based learning with products-based practices. In the conventional model the student in a university is generally confined to theory-based sessions followed by facility based practical and some exposure in prototype ecosystem, limited to the infrastructure available in the University. This is sometimes followed by an internship which mostly has low level of monitoring regarding learning outcome.

In the dual model of education, the student spends a few days a week at College/University learning theory and foundation skills pertaining to work assigned at the industry.

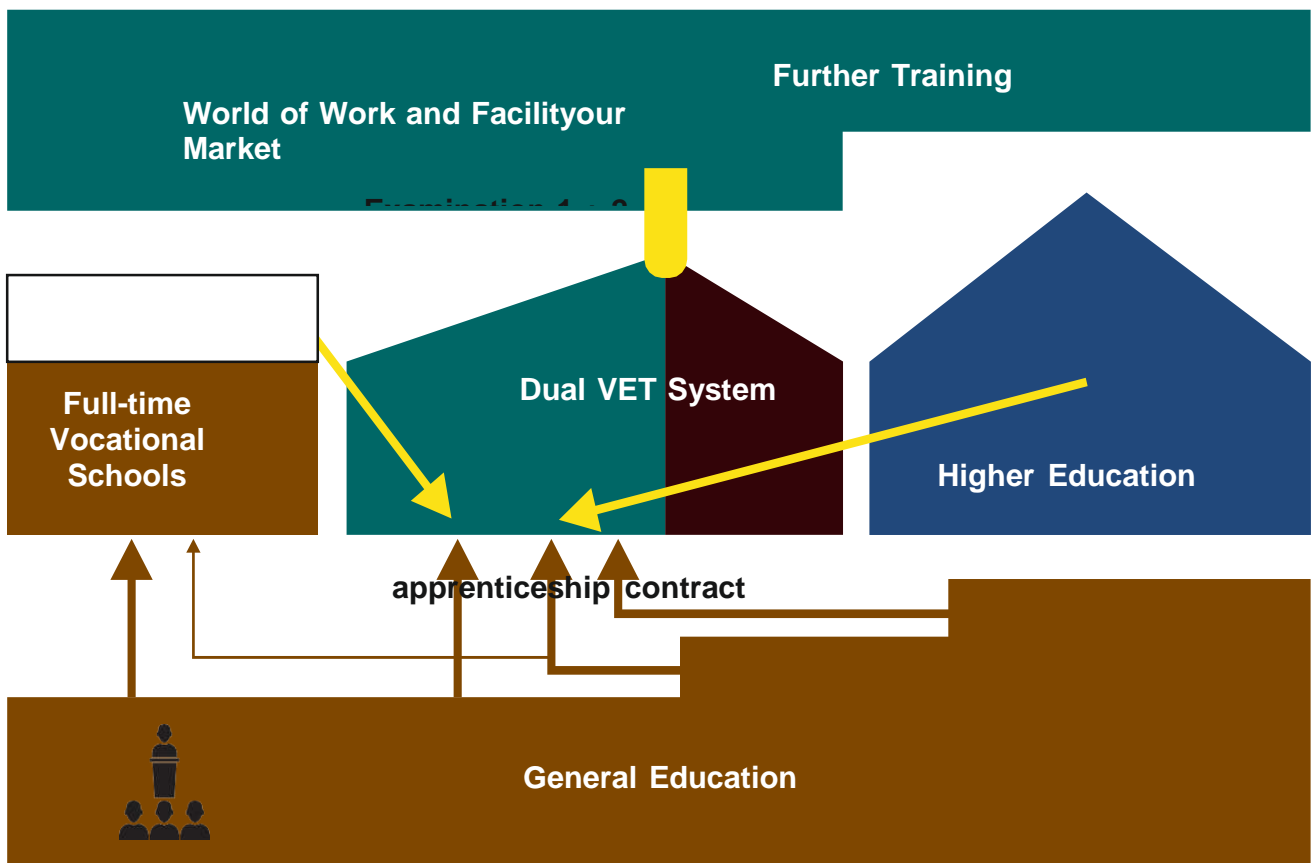
For example, a student whose job profile includes creating technical drawings of transformers of various capacities, will attend University courses only for learning theory fundamentals underpinning the outcome and foundation skills and move to the industrial set up to work on the shop floor which means that the student is able to produce technical drawings to industry standards.

The German education model, which is regarded as one of the most advanced and appropriate education models, is framed in dual model of education. The Indian model, has picked up traction after the NEP 2020 in lines of Flexi-MOUs of the Ministry of Skill Development and Entrepreneurship, Govt of India with Universities and Industry but there are certain limitations like

1. Developing framework for Dual Education Model
2. Developing framework for industry/ joint certification



Process to Institutionalise Dual Model



Steps in dual model of education

### **The university vis-a-vis Dual model of education**

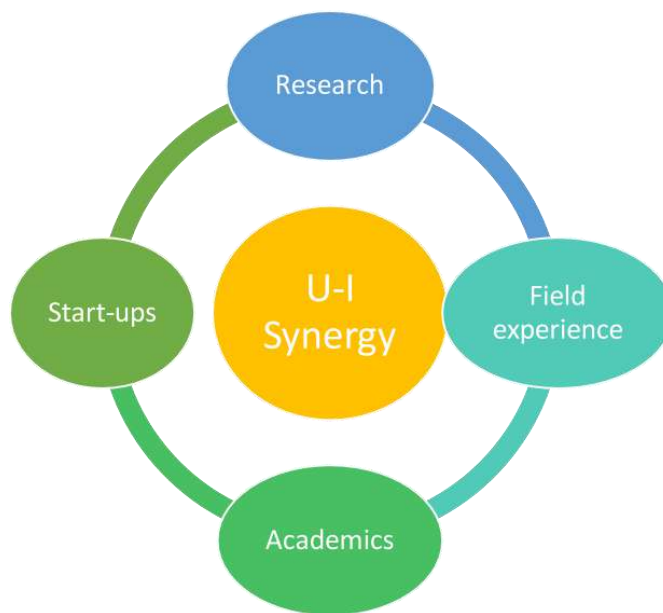
National Employability Enhancement Mission (NEEM) is one of the manifestations of Dual model of education of Government of India. It is a joint initiative taken by the Government of India and All India Council for Technical Education. The scheme was pioneered with an aim to address the shortage of skilled personnel in India by providing avenues to the following students

- Either pursuing his or her Diploma/Graduation/ Post- Graduation in any technical or non-technical stream.
- Having discontinued studies after Class 10th.

The University has been selected as a NEEM partner by AICTE since 2017 and more than 10000 youths have been trained in different domains under the NEEM. The trainees under NEEM are on the payroll of the University or its social entrepreneurial outreach entities. The trainees engage themselves in experiential learning at the work place, while the theoretical concepts being delivered through on line and contact classes by University's social entrepreneurial outreach entity Gram Tarang which is the partner of NSDC. After the completion of 3 years of learning at the factory site, they are eligible for a semester at the University. It qualifies their eligibility for D.Voc or B.Voc degrees.

## **Industrial Reorientation of University Programmes and Curricula**

Universities have the requisite tools to inculcate a definite skill-set amongst their students through various courses and programs. However, reorienting the university programs and curriculum to suit industry requirements along with initiation of dedicated courses on 'Entrepreneurship', 'IPR' and 'Technology Commercialization' will apprise the students to the requirements of the innovation ecosystem. This will promote industry engagement in curricula designing and give a fresh perspective to academic learning.



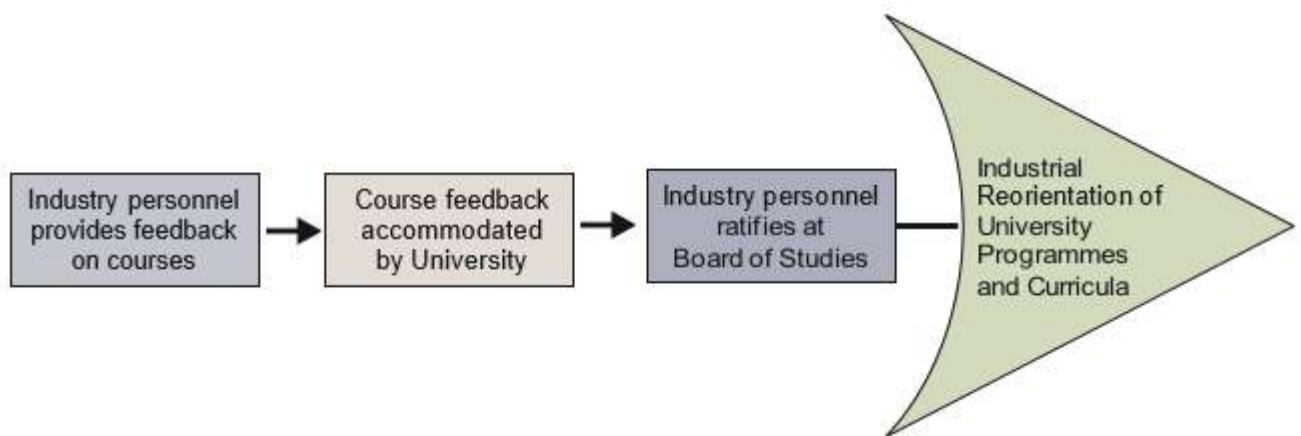
*U-I Synergy at a Glance*



### **The university’s Implementation Model**

The University’s academic model is built in assigning the highest weightage to action- learning. Each of the subject is divided into Theory-Practice-Project model. The students of mathematics can visualize the trigonometric functions in real time. Similarly, a Mechanical Engineering student can attain specialization in adomain of interest like Additive Manufacturing, Automobiles, Design, Wood Engineering and others. This enables the students to become a lateral thinker and executer. The same is witnessed in their achievements in World Skillsor as an entrepreneur.

It is possible because the students study industryrelevant subjects and the courses are revised every year or as and when the need arises. The University has expert representatives from Industries in the Board of Studies. The experts advise on the sylfacilityus based on the contemporarneeds and the same are incorporated by the University in the BoS. The University follows adynamic course curricula and content.



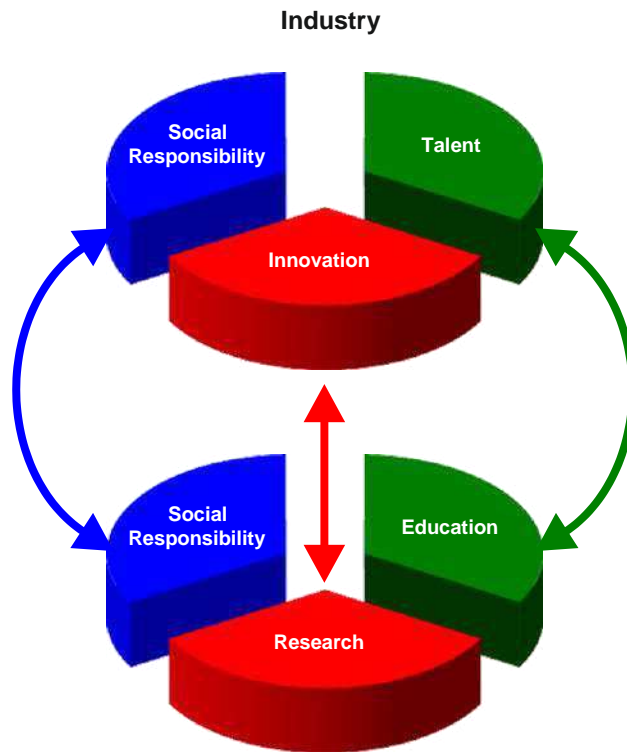
*The university’s model to reorient academics in tandem to industry*

## **Cutting edge research and Action Learning**

A dynamic industry always strives to expand its operations into multifarious areas. In such cases it is neither technically or economically feasible to institute a separate R&D wing for each problem statement. The University, which has technically competent manpower, can aid in solving this problem. The faculty at the University with research degrees in different domains can take up the R&D problems. The students can also get benefit with an industry sponsored Doctorate degree with live learning with tangible output.

The university being focused in integrated learning and action research, it has established active and evolving partnerships with Industries and Organizations e.g. Wipro for 3D, Indian Navy – DGNP for Integrated Projects and so on which navigates the University's research journey.

## Industry-Academia Colfacilityoration



### University`s endeavors

The University has launched 21 research centers on 15th of August 2020 with an aim of promoting research with focus solely on innovations, incubation and entrepreneurship. Faculty members and research scholars are associated with these research centers and individual faculty has mandatory research goals. They are highly motivated to undertake research projects in thrust areas. The University has a well-defined policy framework for promotion of research which creates an encouraging environment for faculty members and facilitate ease of performing. The University has provision to provide seed money grants to faculty members to motivate them to undertake research activities and product innovation which can be subsequently patented and commercialized. These grants facilitate research activities and provide an opportunity to apply grants to government and non-government funding agencies. More details on research centers is referred to, <https://research.cutm.ac.in/>

### Promoting technology innovation centre in frontier areas

As scientific innovations are requisite for economic success, a 'Technology Innovation Centres (TICs)' in the university settings is called for in partnership with industry. The long-term goal of TICs is to develop action leaders in a dedicated thrust area. Besides, TICs is expected to have a dedicated scientific staff, high-end instrumentation facility and active industry participation. Each TIC will work under "Hub and Spoke" model, by networking with other research institutes and public/private organizations having same or similar interests.



*U-I Symbiosis and its manifestation*

### **University's Endeavour**

Technology Innovation Centre in frontier areas are proposed on the following

1. Smart Transformer in colfacilityoration with Indian Institute of Science, Bengalure.
2. Manufacturing of components of complex geometrical profiles by Bharat Dynamics Limited.

### **Promoting entrepreneurship eco-system**

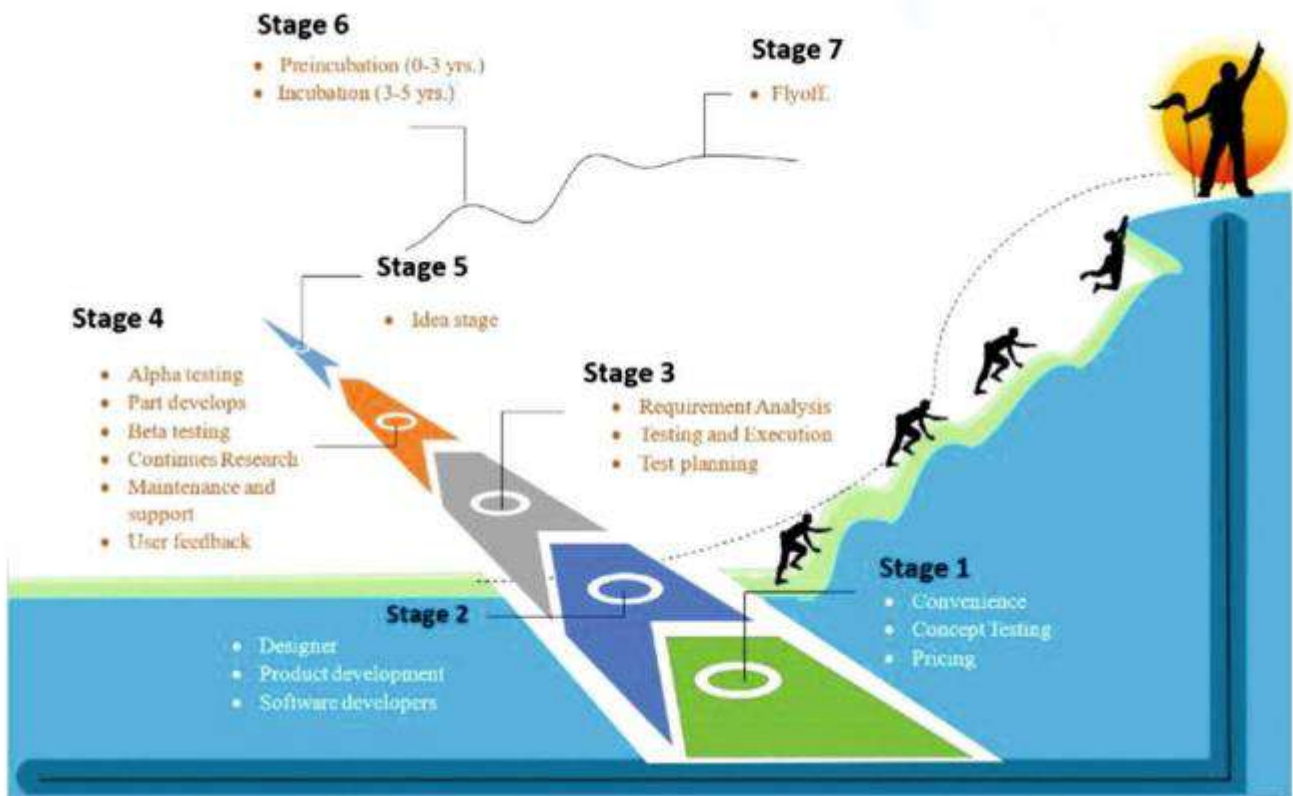
Academia is a key player of the National Innovation Ecosystem. However, it is not so well connected with proper market linkages. The inherent business-averse nature prevents Universities and faculty from realizing the full potential of the academia ecosystem, thereby impeding the translation and commercialization of most of the research outputs.

This limitation can be mitigated through the inception of entrepreneurial activities within the university campuses, consequently promoting sustained U-I symbiotic relationships. A few of the solutions the university practices are as follows:

1. Pre-incubation centres
2. Incubation centres
3. Entrepreneurship cell

The above activities not only encourages students, academic researchers and faculty members to orient themselves entrepreneurially, but it is will gradually profess a culture that is entrepreneurship centric.





Stages of incubation

### University’s Endeavour

The University nurtures and strives for research that translates to publications, patents, copy-rights, innovations, and products. Centre for Innovators, Entrepreneurs and Commercialization (CIEC) is an incubator for nano, mini and novo entrepreneurs and enterprises leveraging on strong industry connect of the University. The University has also established state-of-the-art facility laboratories and production facilities with sponsorship and partnership with different industries as detailed in the next section.

CIEC leverages on these facilities, i.e., the state-of-the-art automobile facilities, 3D printing facility, digital design facility and research outputs created by various research centres to encourage and nurture entrepreneurs. It also promotes entrepreneurship development among the students, faculty members, and the community around its Campuses. The University offers a multi-seat co-working space that currently hosts fifteen ventures at various stages of their development. It also conducts events at regular intervals to identify talent among students and faculty members through hackathons, innovation fairs, and other events. The start-ups are nurtured not only by the mentor-faculty but also through continuous and sustained industry linkages and exposure. The above table gives the details of start-ups incubated by CIEC,

| Sl. No. | Name of the Startup  | Company Registration No.  | Focus Area           | Registration Date |
|---------|--|---------------------------|----------------------|-------------------|
| 1       | Scottish Cafe Pvt. Ltd   | U92490OR2021PT<br>C038456 | Restaurant service   | 16-12-2021        |
| 2       | eVArt LLP  | AAZ-0026                  | E-bike               | 13-10-2021        |
| 3       | Vatsalya Wellness Pvt. Ltd.  | U17290BR2021PT<br>C051853 | Healthcare           | 29-04-2021        |
| 4       | Centurion Gram Sanjeevani  | SRN M17235185             | Medicine             | 26-11-2020        |
| 5       | Skyy Rider Electric Pvt. Ltd.  | U34100OR2020PT<br>C034758 | Automobile           | 10-11-2020        |
| 6       | Centurion MachTech   | SRN M16863920             | CNC products         | 21-10-2020        |
| 7       | Centurion Wood Works   | SRN M16783300             | Wood works           | 16-10-2020        |
| 8       | Gram Tarang Garments   | SRN M16807992             | Textile              | 13-10-2020        |
| 9       | Gram Tarang Technical Vocational Training Services Pvt. Ltd. (GTVET) | U80902OR2020PT<br>C034184 | Ed-tech              | 17-09-2020        |
| 10      | Centurion Fab  | SRN M15996390             | Aesthetic wood works | 14-09-2020        |
| 11      | Hids Technology Pvt. Ltd   | U34100OR2020PT<br>C033613 | AR and VR            | 31-07-2020        |
| 12      | Sangam Designs LLP   | AAR-5155                  | Textile              | 06-01-2020        |
| 13      | Odesi Handlooms and Handicrafts Private Limited                      | U17299OR2019PT<br>C031922 | Textile              | 25-11-2019        |
| 14      | Bivabari Fashions pvt ltd  | U18109OR2019PT<br>C030972 | Textile              | 03-05-2019        |
| 15      | Skyy Rider Automotive Pvt Ltd.                                       | U80904OR2018PT<br>C028377 | Automobile           | 22-02-2018        |

## Incentivization in Academia

The credibility and promotion of university teaching has caused faculty to align towards research publications, thereby offering little motivation for translational research. Certain category of research papers carries more points than Intellectual Property. Research paper publication time can be fast forwarded which is not possible in case of IP. In this scenario Universities and University Grants Commission may consider to tweak the promotion criteria favoring towards IP. Besides, series of awareness programmes must be conducted to acknowledge value of an IP and commercialization of IP.

### University's Endeavour

Centurion University has instituted awards and rewards for the faculty members publishing research papers. However, highest incentivisation is assigned for Intellectual Property like Patents and Copyrights and Commercialisation. Besides, the promotion criteria of the university assigns priority for Intellectual Property and commercialisation of IP.

## Case Studies

# CoE in Automobile Engineering

Heavy motor vehicles actionlearning facility: Ashok Leyland





The University has established an action learning facility on heavy motor vehicle in partnership with Ashok Leyland. The facility is equipped with a variety of multi-cylinder engines, transmission system and all required tools as per Ashok Leyland Standard Operating Procedures.

### **Unique Features**

The center serves as Regional Training Center (Eastern Zone) for Ashok Leyland employees.

### **Training Manuals**

The following manuals are provided by Ashok Leyland

1. Engine overhauling procedure
2. Engine troubleshooting and fault diagnostics
3. Transmission system

### **Aim and objectives of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of engines of heavy vehicles, transmission system and use of different tools.

To provide hands-on knowledge, experiential learning and practice linked pedagogy on the following:

1. Engine Functions
2. Engine Assembly
3. Overhauling the engine
4. Functioning and Overhauling of the transmission system
5. Engine condition monitoring

### **Outcomes**

1. Conversant in using scan tool for fault diagnostics
2. Ability to diagnose fault manually
3. Ability to use of various precision measuring instruments
4. Ability to use different engine assembling and disassembling tool
5. Enhancing Employability and Entrepreneurship

### **Caters to**

This facility caters to students of BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS –ITI (DGT/NCVET), CITS- ITOT (DGT/NCVET) and World Skills participants. It also serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of heavy commercial vehicles. The students of World Skills are trained on their required test projects and in a real time simulated environment.

### **List of equipment**

1. Neptune series 6-cylinder engine
2. H-series 6-cylinder engine
3. Front axles

4. Rear axles
5. Differential
6. Steering gear box
7. Toolkit

### **Market Linkages**

The facility through the rigor of the training enables the students to choose path of entrepreneurship and create employment. It opens other avenues for the students like enhanced employability and further excel in their job profile.

### **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

## Heavy motor vehicles actionlearning facility: Eicher



The University has established an action learning facility on heavy motor vehicle in partnership with Eicher. The facility is equipped with a variety of multi-cylinder engines, transmission system and all required tools as per Eicher Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by Eicher

1. Engine Overhauling Procedure
2. Engine trouble shooting and fault diagnostics
3. Transmission system

### **Aim and objectives of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of engines of heavy vehicles, transmission system and use of different tools. To provide hands-on knowledge, experiential learning and practice linked pedagogy on the following:

1. Engine Functions
2. Engine Assembly
3. Overhauling the engine
4. Functioning and Overhauling of the transmission system
5. Engine condition monitoring

### **Outcomes**

1. Conversant in using scan tool for fault diagnostics
2. Ability to diagnose fault manually
3. Ability to use of various precision measuring instruments
4. Ability to use different engine assembling and disassembling tool
5. Enhancing employability and entrepreneurship

### **Caters to**

This facility caters to students of BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS –ITI (DGT/NCVET), CITS- ITOT (DGT/NCVET) and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of heavy commercial vehicles. The students of World Skills are trained on their required test projects and in a real time simulated environment.

### **List of Equipment**

1. E683 TCI water cooled: 6-cylinder DI Engine: 4984 CC
2. Engine with Exhaust Gas Analyzer
3. Driving simulator
4. Front axles
5. Rear axles
6. Differential
7. Steering gear box
8. Tool kit



## **Market Linkages**

The facility through the rigor of the training enables the students to choose path of entrepreneurship and create employment. It opens other avenues for the students like enhanced employability and further excel in their job profile.

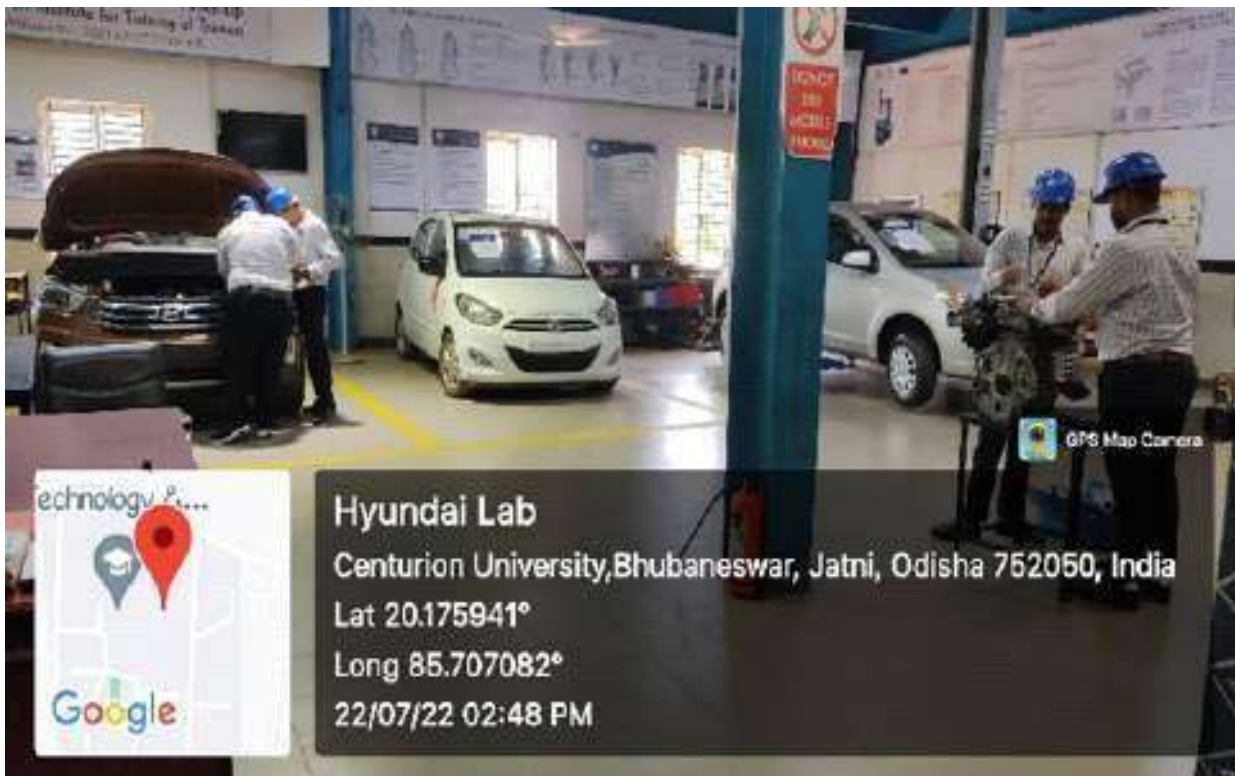
## **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

## Light Wight Commercial Vehicle Action Learning Facility: Hyundai



The University has established an action learning facility on light passenger motor vehicles in partnership with Hyundai Motors. The facility is equipped with vehicles such as Creta, I10, I20, live working models, cut sections of different engines and all required tools as per the Hyundai Training Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by Hyundai,

1. Complete electrical wiring
2. Engine Overhauling Procedure
3. Engine troubleshooting and fault diagnostics

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of car engines, transmission system, electrical system and suspension system.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Engine Functions
2. Engine Assembly
3. Overhauling the engine
4. Functioning and Overhauling of the transmission system
5. Overhauling suspension system and replacement of oil, seals and others.
6. Electrical fault diagnostics
7. Engine condition monitoring

### **Outcomes**

1. Conversant in using scan tool for fault diagnostics
2. Ability to diagnose fault manually
3. Able to use of various precision measuring instruments
4. Able to use different engine assembling and disassembling tool
5. Ability to calculate luminescence value and adjust the head, fog and taillights accordingly
6. Enhancing Employability and Entrepreneurship

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS – ITI (DGT/NCVET), CITS-ITOT (DGT/NCVET) and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any light motor vehicles. The students of World Skills are trained on their required test projects and in a real time simulated environment.

### **List of equipment**

1. Creta live car
2. I10 live car
3. Working engine models
  - a. Creta 1582 Cubic Centimeter
  - b. I20 1493 Cubic Centimeter
  - c. I10 1197 Cubic Centimeter
4. Tools and Equipment for the Facility

### **Market Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies pertaining to passenger cars. Because of the rigour of the learning, students are and will be able to choose path of entrepreneurship, enhanced employability and excel in their job profile.

### **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)



## Troubleshooting and Maintenance Action Learning Facility: BOSCH and MANATECH



The University has established an action learning facility on light passenger motor vehicle trouble shooting and maintenance in partnership with BOSCH and MANATECH. The facility is equipped with different troubleshooting apparatus and all required tools as per the BOSCH and MANATECH Training Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by BOSCH and MANATECH

1. RFID wheel alignment setup
2. AC Servicing
3. ECU fault diagnostics
4. Electrical fault diagnostics
5. Wheel condition monitoring

### **Aim of the action learning facility**

To enable students to get hands on training on automotive AC servicing, fault diagnosis in sensor and electrical system, wheel balancing and alignment

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Servicing of Air Conditioner of light weight passenger vehicle
2. Fault diagnosis of Electronic Control Unit
3. Diagnosing electrical fault
4. Condition monitoring of wheels
5. Wheel alignment

### **Outcomes**

1. Conversant in using scan tool for fault diagnostics
2. Ability to overhaul an Automobile Air Conditioner
3. Ability to diagnose an electrical fault
4. Visual inspection of wheel to understand Castor, Camber, Toe in and out
5. Wheel alignment using RFID technique
6. Use of precision metrological tools
7. Enhancing Employability and Entrepreneurship

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS-ITI (DGT/NCVET), CITS- ITOT (DGT/NCVET) and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any light motor vehicles using state of the art tools by BOSCH and MANATEC. The students of WorldSkills are trained on their required test projects and in a real time simulated environment.

## **Market Linkages**

The aim of the action learning facility is to enable student with functional skill set on automotive AC servicing, fault diagnosis, wheelbalancing and alignment system. By gaining hands on experience on this field, the student can choose to become an entrepreneur by setting up of own unit or can opt for job in automotive sector as service engineer or technician.

## **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

## Light Passenger Motor Vehicle Action Learning Facility: BMW





The University has established an action learning facility on light passenger motor vehicles on the premium segment in partnership with BMW. The facility is equipped with live model of a BMW car and all required tools as per the BMW Training Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by BMW,

1. Complete electrical wiring
2. Engine Overhauling Procedure
3. Engine troubleshooting and fault diagnostics

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding (of car engines on premium segment) transmission system, electrical system and suspension system.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Engine Functions
2. Engine Assembly
3. Overhauling the engine
4. Functioning and Overhauling of the transmission system
5. Overhauling suspension system and replacement of oil, seals and others.
6. Electrical fault diagnostics
7. Engine condition monitoring

### **Outcomes**

1. Preventive and scheduled maintenance of high end premium cars.
2. Conversant in using scan tool for fault diagnostics
3. Ability to diagnose fault manually
4. Able to use of various precision measuring instruments
5. Able to use different engine assembling and disassembling tool
6. Ability to calculate luminescence value and adjust the head, fog and taillights accordingly
7. Enhancing Employability and Entrepreneurship

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS-ITI (DGT/NCVET), CITS- ITOT (DGT/NCVET) and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any light motor vehicles. The students of World Skills are trained on their required test projects and in a real time simulated environment.

**List of equipment**

BMW twin power turbo inline engine: 4cylinders

**Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies pertaining to premium segmentpassenger cars so they excel in their job profile.

**Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

## Light Motor Vehicle with Gears Action Learning Facility:Yamaha



The University has established an action learning facility on light motor vehicles with gears in partnership with Yamaha. The facility is equipped with live motor cycles for hands on experiential learning and all required tools as per the Yamaha Training Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by Hyundai,

1. Complete electrical wiring
2. Engine Overhauling Procedure
3. Engine troubleshooting and fault diagnostics

### **Unique Features**

1. Training manuals in vernacular
2. Serves as Regional Training Center for Training of Technical workers

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of two wheeler engines, transmission system, electrical system and suspension system.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Engine Functions
2. Engine Assembly
3. Overhauling the engine
4. Functioning and Overhauling of the transmission system
5. Overhauling suspension system and replacement of oil, seals and others.
6. Electrical fault diagnostics
7. Engine condition monitoring

### **Outcomes**

1. Ability to diagnose fault manually
2. Able to use of various precision measuring instruments
3. Able to use different engine assembling and disassembling tool
4. Ability to calculate luminescence value and adjust the head, fog and taillights accordingly
5. Ability to overhaul any Yamaha motorcycle
6. Enhancing Employability and Entrepreneurship

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS – ITI (DGT/NCVET), CITS- ITOT ( DGT/ NCVET) and World Skills participants.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any motor cycles. The students of World Skills are trained on their required test projects and in a real time simulated environment.



### **List of equipment**

1. R15: 145 Cubic Centimeter with 6 transmission gears
2. FZ: 145 Cubic Centimeter with 5 transmission gears
3. F25: 149 Cubic Centimeter with 5 transmission gears
4. SZX: 150 Cubic Centimeter with 5 transmission gears
5. Gladiator: 150 Cubic Centimeter with 5 transmission gears
6. Tools and Equipment for the Facility

### **Market Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies pertaining to passenger cars. Because of the rigor of the learning, students are and will be able to choose path of entrepreneurship, enhanced employability and excel in their job profile.

### **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

## **Industrial Material Handling Action Learning Facility: Godrej**



The University has established an action learning facility on hands on experiential learning on Industrial Material Handling using Forklift Truck in partnership with Godrej. The facility is equipped with Forklift trucks and all required tools as per Godrej Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by Godrej

1. Troubleshooting and fault diagnostics
2. Operation manual

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of Industrial Material Handling vehicles, its operations and basic troubleshooting.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Ensure safe and healthy working practices
2. Calculation of unit load and carry load
3. Ensure that forklift is fit for use
4. Driving a forklift truck
5. Basic troubleshooting

### **Outcomes**

1. Ability to safely drive a fork lift truck in an industrial environment
2. Ability to balance the load properly to avoid toppling
3. Usage of precision metrological equipment
4. Carry out condition monitoring and scheduled maintenance

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS-ITI (DGT/NCVET), CITS-ITOT(DGT/NCVET) and World Skills participants.

The students will be able to carry out safely drive a fork lift truck and carry out basic troubleshooting.

### **List of equipment**

1. Fork lift truck
2. Requisite tools and equipment
3. Safety gears

## **Market Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies pertaining to industrial material handling vehicle. Because of the rigor of the learning, students are and will be able to choose path of entrepreneurship. It sounds prudent because of Odisha being endowed with several mineral resources and allied mining activities where in Forklift trucks are of paramount importance. Besides this it opens other avenues for the students like enhanced employability and further excel in their job profile.

## **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)



# CoE in Manufacturing

Machining Shop and Central Fabrication Unit:Axis Bank



The University set up state-of-the-art Central Fabrication Unit and training center in partnership and sponsorship with Axis bank. It has high end CNC machines, non-conventional machine and allied metrological instruments. The facility conforms to ISO 17000 group of standards and other procedures set by manufacturers.

### **Unique Features**

It serves as both training and production center where students are engaged in live learning.

### **Manuals Used**

The facility uses manuals provided by manufacturers

1. Standard Operation Procedure
2. Electrical wiring
3. Fault diagnostics and condition monitoring
4. Software for SEM, CMM

### **List of equipment available at the facility**

1. Turn Mill Center
2. Vertical Machining Center
3. Turning Center
4. High end metrological instruments: CMM, SEM

### **Aim and objective of the facility**

Central Fabrication Unit is used for production activities involving students in action-learning through hands-on participation. It enables students to achieve an in-depth knowledge on Design, NC Code Generation, Part Programming, Machining in both conventional and non-conventional machines besides knowledge of metrology.

Learning through Involvement. The students gain hands-on learning by getting involved in the production activities. The pedagogy is linked to the production process as Skills for Success, Domains and other specialized courses. They gain knowledge and hands on experience on the following:

1. Safety procedures
2. Basics of ISO 17025 standard
3. Precision metrological instruments
4. Material Requirement Planning
5. Production planning
6. Computer assisted process planning
7. NC code generation and diagnostics using MASTERCAM
8. Basics of different sampling methods
9. Operation of non-conventional machines like EDM
10. Destructive and Non-Destructive testing of end products
11. Basic troubleshooting of machine

## **Outcome**

1. Conversant with production facility`s safety procedure and standards.
2. Ability to operate CNC Milling, Turning, Die-sinking EDM.
3. Conversant in using high precision metrological instruments and their maintenance: Coordinate Measuring Machine, Scanning Electron Microscope, XRay Fluorescence Spectroscopy.
4. Hands-on experience on Retrieval and Generative Computer Aided Process Planning
5. Understand the differences between the product and process layout
6. Hands-on experience on Universal Tensile Tester (Tensile, Compressive, 3-point and 4-point Bending)
7. Ability to operate Scanning Electron Microscope and interpret the results for Mild Steel, Titanium, Aluminum and its alloys= Ability to perform minor trouble shooting

## **Caters to**

The facility caters to the students of BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including B.Sc), Diploma, CTS-ITI (DGT/NCVET), CITS - ITOT (DGT/NCVET) and World Skills courses.

This facility enables the students learn to manufacture a complex product while adhering to all prerequisites. They can also carry out basic trouble shooting of the machines.

## **Market Linkages**

The students because of the rigor of the learning, will be able to choose the path of entrepreneurship, towards enhanced employability, which will help them excel in their job profiles.

## **Future Goals**

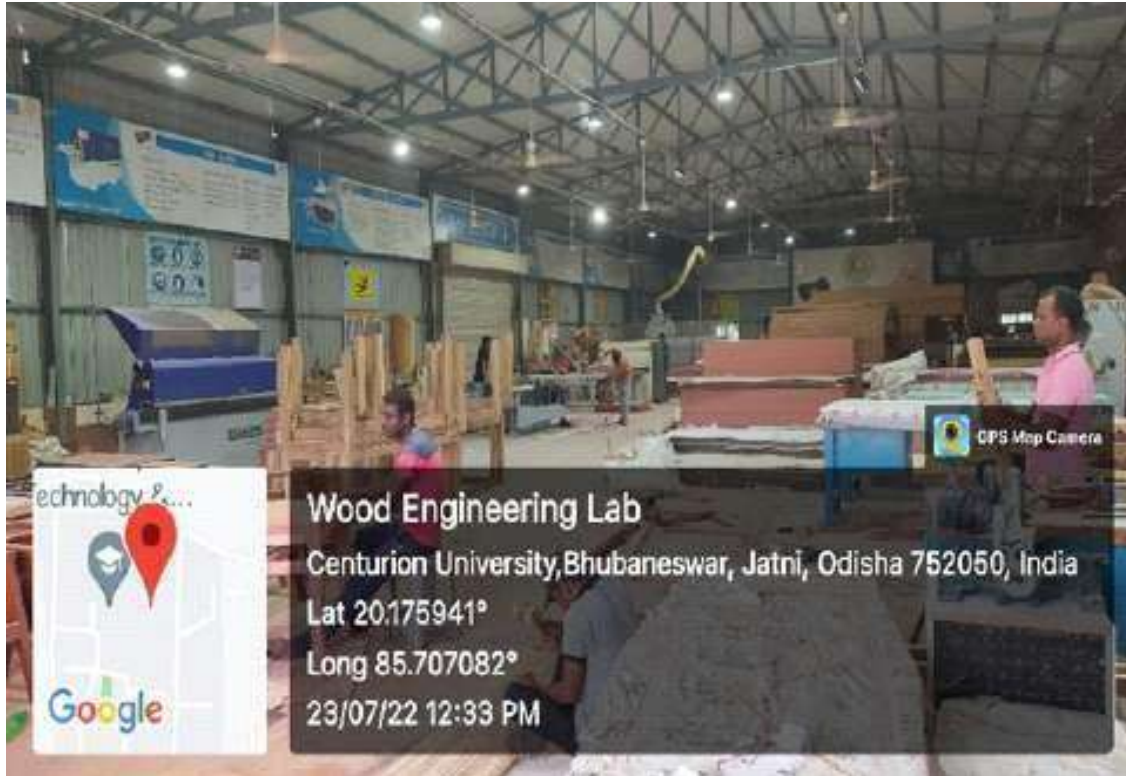
1. The tool room envisions to double its production capacity in a span of 3 years with a yearly increment of 30%, 40% and 30%.
2. It has also planned to train 1,000 students with no formal education in area of CNC and conventional machining to create employability.

## **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Partnership for Goals (17)



# WELL- learning facility: Felder





The University has established a state of art infrastructure in wood manufacturing called Wood Engineering Action Learning Facility (WELL) in sponsorship with Felder for an endeavor towards self-sustainability and creating livelihoods. The center serves as action learning facility for students. The facility is equipped with high end wood CNCs, Routers and necessary tools and equipment.

### **Training Manuals**

The following manuals are provided by,

1. Machine Operation Procedure
2. Fault diagnostics and condition monitoring

### **Aim of the action learning facility**

Learning through involvement: Students learn as a part of the production process and gain basic, comprehensive and in-depth understanding of wood working and different wood products.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Precautionary measures
2. Selection of different types of wood
3. Selection of correct cutting parameters
4. Application of hand tools
5. Clear understanding of situations requiring application of hand tools and machines
6. Wood dust health hazard and its prevention
7. Metrological and inspection equipment

### **Outcomes**

Hands on learning and ability to operate (both soft and hard woods) and carry out following operations,

1. Drilling and boring
2. Edge and band sawing
3. Correct usage of sliding table panel
4. On spindle molder
5. Grinding operations
6. All the above operations with hand-tools
7. Quality assurance of the end products using inspection and metrology tools

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS-ITI (DGT/NCVET), CITS-ITOT (DGT/NCVET) and World Skills participants. It also serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out manufacturing of any complex wood products (either soft

or hard) using both hand tools and power tools.

### **List of equipment**

1. Drilling and multi-boring machine
2. Band saw
3. Edge banding
4. Sliding table panel saw
5. CNC machining center
6. Tilting spindle
7. Horizontal mortiser
8. Surface belt sander

### **Market Linkages**

The cardinal goal of learning facility is endowing students with hands on learning skills and competencies pertaining to manufacturing of wood products. Because of the rigour of the learning, students are and will be able to choose path of entrepreneurship, enhanced employability and excel in their job profile.

### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Partnership for Goals (17)

## Computer Numerical Control:DMG Mori





The University set up facilities with state-of-the-art Advanced Computer Numerical Control machines in partnership with DMG Mori. The facility, which is equipped with high-end CNC machines and precision metrological instruments, conforms to ISO 17000 group of standards and other procedures set by DMG.

### **Unique Features**

This is the ONLY facility in the country that has a DMG Mori Turn Mill.

### **Manuals Used**

The facility uses manuals provided by DMG Mori:

1. Standard Operation Procedure
2. Electrical wiring
3. Fault diagnostics and condition monitoring
4. MASTERCAM

### **List of equipment available at the facility**

1. Turn Mill Center
2. Vertical Machining Center
3. Turning Center
4. High end metrological instruments: CMM, SEM

### **Aim of the facility**

The Facility is used for production activities involving students in action-learning through hands-on participation. It enables students to achieve an in-depth knowledge on Design, NC Code Generation, Part Programming and Machining.

Learning through Involvement. The students gain hands-on learning by getting involved in the production activities. The pedagogy is linked to the production process as Skills for Success, Domains and other specialized courses. They gain knowledge and hands on experience on the following:

1. Safety procedures
2. Basics of ISO 17025 standard
3. Precision metrological instruments
4. Material Requirement Planning
5. Production planning
6. Computer assisted process planning
7. NC code generation and diagnostics using MASTERCAM
8. Basics of different sampling methods
9. Destructive and Non-Destructive testing of end products
10. Basic troubleshooting of machine

### **Outcomes**

1. Conversant with production facility's safety procedure and standards.

2. Conversant in using high precision metrological instruments and their maintenance: Coordinate Measuring Machine, Scanning Electron Microscope, XRay Fluorescence Spectroscopy.
3. Hands-on experience on Retrieval and Generative Computer Aided Process Planning.
4. Understand the differences between the product and process layout.
5. Hands-on experience on Universal Tensile Tester (Tensile, Compressive, 3-point and 4-point Bending).
6. Ability to operate Scanning Electron Microscope and interpret the results for Mild Steel, Titanium, Aluminum and its alloys.
7. Ability to perform minor trouble shooting.

### **Caters to**

The facility caters to the students of BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including B.Sc), Diploma, CTS- ITI ( DGT/ NCVET), CITS- ITOT ( DGT/NCVET) and World Skills courses. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

This facility enables the students learn to manufacture a complex product while adhering to all prerequisites. They can also carry out basic trouble shooting of the machines.

### **Market Linkages**

The students because of the rigor of the learning, will be able to choose the path of entrepreneurship, towards enhanced employability, which will help them excel in their job profiles.

### **Future Goals**

1. CIF envisions to double its production capacity in a span of 3 years with a yearly increment of 30%, 40% and 30%.
2. It has also planned to train 1,000 students with no formal education in area of CNC and conventional machining to create employability.

### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Partnership for Goals (17)

# CoE in Rapid Prototyping

## Fused Deposition Modeling:AMS India



Prototyping is pre-requisite for development of products, visualization and concept modelling. The University, in colfacilityoration with AMS India,has developed a Center of Excellence (CoE) for Additive Manufacturing. The CoE is equipped with a versatile Fused Deposition Modelling, a 3D Scanner, a furnace and workstations.

### **Unique Features**

1. The University has an awarded patent on a 3D printer which was in-situ manufactured.
2. This facility serves as advanced prototypingcenter for incubated start-ups of the University.

### **Manuals Used**

The following manuals are provided by AMS

1. Machine Operations for FDM, 3D scannerand furnace
2. Trouble shooting and fault diagnostics forthe above

### **Aim and objective of the facility**

To enable students to gain basic, comprehensiveand in-depth understanding of Rapid Prototyping techniques, hands-on experiential learning onFDM, 3D scanner, 3D modelling software (CATIA) and safe use of metal furnace.

To provide hands-on knowledge, experientiallearning and practice linked pedagogy on the following

1. Safety procedures
2. The Design Process: New Design andAdaptive Design
3. Operations of FDM
4. Operations of 3D scanner
5. Operations of furnace concerning differentmetals
6. 3D modelling and conversion to StandardTessellation Language
7. Reverse engineering
8. Inspection and metrology

### **Outcome**

1. Understanding of operational safety procedures
2. Ability to create a new design and an adaptive design
3. Hands-on learning on FDM with wide rangeof materials: polymers, metals, ceramics andgels.
4. Hands-on learning on furnace for melting wide range of metals
5. Ability to generate coordinates using 3D scanner to print components
6. Ability to convert a part drawing file to STLand vice versa
7. Ensuring quality of end prototype usingdifferent visual inspection techniques
8. Ability to use Scanning Electron Microscope to evaluate stair stepping effects.

### **Caters to**

The facility caters to the students of BTech,MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma and World Skills participants and for the incubated



companies. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to print complex products adhering to all prescribed requisites. The companies can use it for developing prototype with variegated materials available.

### **List of equipment**

1. FDM
2. 3D scanner
3. Furnace
4. Workstations

### **Market Linkages**

The students get exposed to different modeling software and hands on experience in advanced prototyping machines. It is the learning which enables them to choose path of entrepreneurship as a concept modeler, New Product Development Engineer and also it will help them excel in their job profiles.

### **Future goals**

Train 1,000 school students in the area of creative design and 3D Printing.

### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Partnership for Goals (17)

## Go-To-Market: Dassault Systems



Prototyping facility is a pre-requisite for development of products, visualization and concept modeling. The University in partnership with Dassault Systems India has developed a Future Nexus Facility for Design and Manufacturing. The Facility is equipped with a Design Thinking and Managing Innovation Through GATE Process, PLM Tools on Dassault Platform (Design and Validation using Dymola, Catia, Simulia), Process management (Using Enovia), Product development and workstations.

### **Unique features**

1. The University has an awarded patent on a3D printer which was in-situ manufactured.
2. This facility serves as advanced prototyping for the University.
3. Design Thinking and Managing Innovation Through GATE Process.
4. PLM Tools on Dassault Platform (Design and Validation using Dymola, Catia, Simulia)
5. Process management ( Using Enovia )
6. Product Development

### **Aim of the facility**

To enable students to gain basic, comprehensive and in-depth understanding of design techniques, Hands on experiential learning on 3D modelling software (CATIA), Project Management (Enovia), Travel Factor & Wire harness (Dymola) and Product Simulation & validation (Simulia).

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following

1. To familiarize the student with Industrial Product Life Cycle Management Processes
2. Teach Dassault tools for PLM
3. Develop digital prototypes of the products and validate them and innovate for design efficiency.
4. The Design Process: New Design and Adaptive Design
5. 3D modelling and conversion to Standard Tessellation Language
6. Reverse engineering

### **Outcomes**

1. A Digitally Validated Innovatively and efficiently designed product
2. Experience with 3 D experience platform Catia- Simulia- Dymola and Enovia tools
3. PLM cycle management
4. Process Quality monitoring through GATE process
5. Able to create a new design and an adaptive design
6. Ability to convert a part drawing file to STL and vice versa
7. Ensuring quality of end prototype using different visual inspection techniques

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses, Diploma, ITI and World Skills participants and for the incubated companies. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows. The students will be able to Design a complex product for all industry. The companies can use it to their end use for developing prototype with variegated materials available at the facility.

### **List of equipment**

1. High configuration Systems.
2. Advance Software.
3. Advances Fabrication Facility.
4. Assembly shop floor.

### **Market Linkages**

The goal of the Facility follows as

1. Train the student for World Skills
2. Assist idea stage and other startups in concept design and prototyping.
3. Augments students' skill sets
4. Promote entrepreneurship

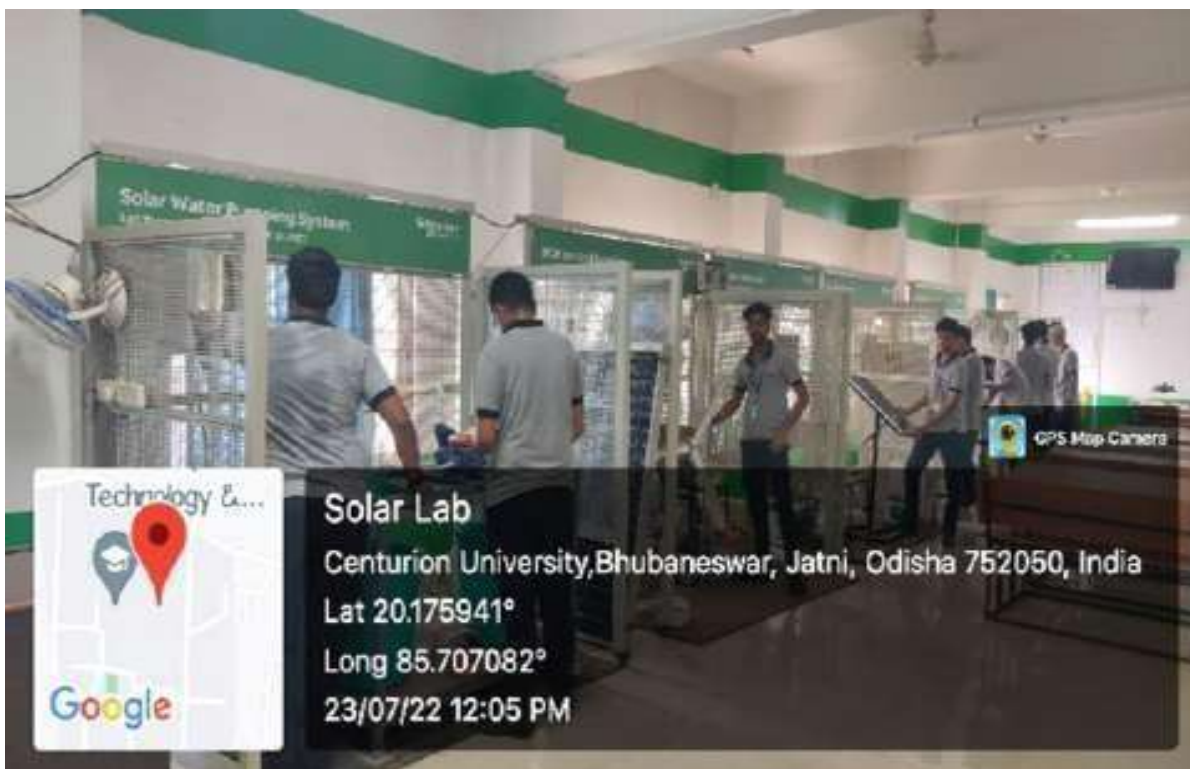
### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Partnership for Goals (17)



# CoE in Energy

## Renewable Energy Action Learning Facility: Schneider Electric India



The action learning facility on renewable energy is established in sponsorship and partnership with Schneider Electric India. It is equipped with Schneider electric benches (off- grid, micro-grid, hybrid, and water pumping systems), solar panels, inverter, controller, battery, DC fans, LED systems, soldering bench, computer, projectors, electrical and mechanical accessories. It adheres to the procedures mandated in training manuals provided by Schneider.

### **Unique Features**

The action learning facility generates its own power endeavouring towards SDG 7 and it is completely run by solar photovoltaic power.

### **Training Manuals**

The following manuals are provided by Schneider Electric,

1. Complete electrical wiring
2. Installation of electrical system
3. Working principle of renewable energy benches

### **Aim and objective of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of renewable energy concerning solar photovoltaics.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. off-grid electrical bench
2. micro-grid electrical bench
3. hybrid electrical bench
4. water pumping systems
5. solar panels and allied accessories
6. LED systems,

### **Outcomes**

1. In depth critical understanding of off-grid, micro grid and hybrid electrical benches.
2. Understanding the Science of semiconductors and photovoltaics
3. Basics into flexible solar cells.
4. Ability to calculate efficiency of solar cell and panels
5. Hands on ability to install solar panels and connect it to requisite
6. Use of precision metrological instruments
7. Basic understanding of HMI and SCADA and integration with solar arrays

### **List of equipment**

1. Schneider electric bench: off-grid

2. Schneider electric bench micro-grid
3. Schneider electric bench hybrid
4. Schneider electric bench water pumpingsystem
5. Soldering bench
6. Solar panels (5W to 500W),
7. Inverter (750 VA to 1500 VA)
8. Controller (3A to 60 A)
9. Battery (4 Ah to 150 Ah)
10. DC fans (12 V 18 W)
11. LED systems

### **Caters to**

BTech, MTech, Skills for Success (SFS), Domain Courses (All UG course including BSc and MSc), Diploma, and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any solar photovoltaic systems. The students of SFS/Domain/World Skills are trained on their required test projects and in a real time simulated environment.

### **Market Linkages**

The objective of the action learning facility is to endow students with the required skills, domains, and competencies pertaining to renewable energy systems. Students will be able to choose path of entrepreneurship, enhance employability and excel in their job profile.

### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Affordable and clean energy (7)
4. Partnership for Goals (17)

## High End Automation Action Learning Facility: FESTO





The University has established an action- learning facility on Pneumatics, Electro- Pneumatics and Programmable Logic Controller in partnership with OPTCL and Festo. The facility is equipped with different high-end pneumatic controllers, Modular Automated Production System, Programmable Logic Controllers and all required tools as per the Festo Training Standard Operating Procedures.

### **Training Manuals**

The following manuals are provided by Festo:

1. Pneumatics
2. Electro-Pneumatics
3. Programmable Logic Controllers

### **Aim and Objectives of the action-learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of different valves, cylinders, electrical system and PLC system.

To provide hands-on knowledge, experiential learning and practice linked pedagogy on the following:

1. Directional and conditional control valve functions of Pneumatics
2. Component Assembly
3. Electro-pneumatics valve functions
4. Functioning of the Festo plate
5. PLC programming
6. Electro-pneumatic fault diagnostics
7. Modular Automated Production System

### **Outcome**

1. Ability to diagnose fault manually in Pneumatics and PLC
2. Ability to use different valves
3. Ability to use different cylinders and solenoid valves
4. Ability to write PLC program with any specified logic
5. Ability to apply knowledge of automation to different area like home, industry 4.0 and other

### **Caters to**

This facility caters to students of BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including Diploma, CITS-ITOT(DGT/NCVET) and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any automation system where PLC and Pneumatics is used. The students of World Skills are trained on their required test projects and in a real time simulated environment.

### **List of equipment**

1. Modular Automated Production System
2. Pneumatic valves
3. Electro-pneumatics valves
4. Single and double acting cylinders
5. Festo PLC
6. Festo face-plate
7. Tools and equipment for the facility

### **Market Linkages**

Through the rigor of training in this facility the students are and will be able to choose path of entrepreneurship, enhanced employability and excel in their job profile.

#### Future Goal

To carry out high end automation projects for outside client bases.

### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Affordable and clean energy (7)
4. Partnership for Goals (17)

## **Transformers Action Learning Facility: OPTCL**



The University has established an action learning facility for manufacturing of Transformers with Odisha Power Transmission Corporation Limited. It serves as an action learning facility for the students where in they experience and participate with hands on experiential learning.

### **Training Manuals**

The following manuals are followed

1. Quality Procedure
2. Testing Procedure
3. Environment and Safety
4. Transformer Manufacturing

### **Aim of the Transformer Unit**

To enable students to gain functional knowledge with skill set of power and distribution of transformer, testing, maintenance and repair, transmission system, electrical system and manufacturing process.

### **Unique Features**

1. Capacity to manufacture 1 MVA transformer and augmenting towards 10 MVA capacity and distribution.
2. BIS Design of Distribution and Power Transformer.
3. NABL Accredited Standard Testing Facility.
4. End to end manufacturing of Distribution and Power transformer.
5. Testing and troubleshooting of Distribution and Power transformer.
6. Skill Development and action research in Transformer manufacturing, testing, repair and maintenance.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Transformer Functions & Operations
2. Transformer Assembly
3. Overhauling the transformer
4. Maintenance of Power & Distribution Transformer.
5. Functioning and Overhauling of the power transmission system
6. Overhauling structural system and replacement of oil, seals and others.
7. Electrical fault diagnostics
8. Transformer condition monitoring

### **Outcomes**

1. Conversant in using tools for fault diagnostics
2. Ability to diagnose fault manually
3. Able to use of various precision measuring instruments



4. Able to use different transformer assembling and disassembling tool
5. Ability to calculate testing parameter value
6. Enhancing Employability and Entrepreneurship
7. Transformer Testing Capability.

#### **Caters to**

M.Tech, B.Tech, Domain Courses, NSQF Skill courses, Diploma, Electrician– ITI (DGT/NCVET), and industrial participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preventive, scheduled and breakdown maintenance of any power & distribution transformer. All The students/trainees/participants are trained on their required test projects and in a real time simulated environment.

#### **List of equipment**

1. Three Phase Variac
2. Auto Transform
3. Working transformer models
  - a. 100 KVA
  - b. 63 KVA
  - c. 25 KVA
4. Tools and Testing Equipment of Facility & Manufacturing Unit

#### **Market Linkages & Job Readiness**

The prime goal of the manufacturing unit and testing facility is endowing students with required skills and competencies pertaining to distribution transformer of 33KV class. Because of the hands on practical, students are able to choose path of entrepreneurship, enhanced employability and also excel in their job profile.

#### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Affordable and clean energy (7)
4. Partnership for Goals (17)

# CoE in Testing and Calibration

## Advanced Material Testing and Calibration



Testing is an important area for accessing suitability of any material for further use in a product life cycle of any component. AMTCL is equipped with all modern testing facility to substantiate the suitability of a material for its end use.

### **Unique Features**

ISO certified test procedures

### **Manuals Used**

The facility uses manuals provided by suppliers

1. Standard Operation Procedure
2. Electrical wiring
3. Fault diagnostics and condition monitoring

### **List of equipment**

1. Universal Testing Machine
2. Roughness Checker Surtroni 25
3. Parr Isotherm Bomb Calorimeter
4. XRF Spectrometer
5. Rockwell Hardness Testing Machine -Digital
6. Profile Projector Pj-A3000 Series
7. Ashing Furnace
8. Volatile Matter Furnace
9. Analytical Sieve Shaker
10. Toolmaker's Microscope

### **Aim and objectives of the action learning facility**

This facility has advanced testing and characterization equipment to facilitate research work in the area of Material Sciences. It caters consultancy for material testing projects for client bases like mining sector company IMPHA and local client bases. The aim of this facility is to impart hands on learning to students on both destructive and non-destructive testing techniques.

### **Learning through involvement**

The students gain hands-on learning by getting involved in the testing and characterization procedure. The pedagogy is linked to the Material Testing Process as Skills for Success, Domains and other specialized courses. They gain knowledge and hands on experience on the following:

1. Safety procedures
2. Basics of ISO 17025 standard
3. Precision metrological instruments
4. Tensile testing using different ASTM standards
5. 3-point bending using different ASTM standards

6. 4-point bending using different ASTM standards
7. Hardness testing using A, B and C scale
8. Material composition of solids and fluids
9. Check profile of gear and screw thread
10. Comparison of profile of gears, threads and others
11. Calculation of heat produced
12. Measure screw thread and gear teeth profile

The facility aims to test and characterize solids and fluids and on the same time it enables the students to hands on learning on these tool and equipment.

### **Outcomes**

1. Awareness of Personal and Equipments safety
2. Understanding material processing for specimen and SOP.
3. Use of proper standard and method for Testing and Calibration.
4. Ability to diagnose fault manually
5. Perform analysis of test and calibration
6. Conducting test as per Standard Operating Procedure
7. Preparation of test and calibration report

### **Caters to**

Diploma, BTech, MTech, PhD, B.Sc, M.Sc, B.Pharm, D.Pharm, Skills for success and domain courses. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

### **Market Linkages**

The students because of the rigor of the learning, will be able to choose the path of entrepreneurship, towards enhanced employability, which will help them excel in their job profiles like in Material Testing Engineer and others.

### **Relevant Sustainable Development Goals**

1. Industry innovation and infrastructure (9)
2. Quality Education (4)
3. Partnership for Goals (17)



## Scanning Electron Microscopy and Coordinate Measuring Machine: JEOL and Accurate Gauging



The University has set up state-of-the-art Mini Tool Room Facility which is equipped with high-end CNC machines, precision metrological instruments, Scanning Electron Microscope (SEM) and Coordinate Measuring Machine (CMM). The tool room serves as an action learning facility

### **Aim of the action learning facility**

To enable students to get both basic and in-depth understanding of Advanced inspection of jobs using CMM and characterization of materials and machining using SEM

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following,

1. Operation of Scanning electron microscope
2. Preparation of sample for SEM microscopy and Preparation of etchant for different metals.
3. Characterization of morphology of the materials
4. Carrying out sputtering of non-conductive materials.
5. Operation of Coordinate measuring machine.
6. Inspection of jobs using CMM
7. Trouble shooting of CMM

### **Outcomes**

1. Conversant in using scanning electron microscope
2. Ability to interpret different material morphology using SEM imaging
3. Able to find the micro defects in machining
4. Able to inspect different jobs using CMM
5. Learn about reverse engineering a product using CMM
6. Usage of precision metrological instruments

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, CTS-ITI (DGT/NCVET), CITS-ITOT (DGT/NCVET) and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to operate SEM and CMM and its allied procedures.

### **List of equipment**

1. Scanning electron microscope
2. Coordinate measuring machine.

### **Market Linkages**

The cardinal goal of the facility is endowing the students with required skill sets in research and material characterization. At the outset, the students will be able to choose path as research

consultants of material testing and characterization in their job profile.

**Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

## Surveying Facility:ONGC





A state of the art Surveying Facility was established by the University in sponsorship and partnership with Oil and Natural Gas Commission. The facility is equipped with high end surveying equipment with an aim to inculcate hands on experiential learning to students.

### **List of Equipments**

1. Differential Global Positioning System(DGPS),
2. Electronic Total Stations (ETS),
3. Ground Penetrating Radar (GPR),
4. Photogrammetry and GIS Software based map preparation
5. Digital Elevation Models.
6. Digital Theodolite (2 nos)

### **Objectives**

1. To teach the basic concept of Geospatial Technology and to do various field works with the help of digital surveying instruments.
2. To provide basics of digital surveying and mapping of earth surface using GPS, DGPS, GPR.

### **Outcomes**

1. Gain knowledge about the structure of spatial data including file associations, attribute tables, Metadata, coordinate systems, and projections.
2. Carry out measurements Differential Global Positioning System (DGPS) / Global Navigation Satellite System (GNSS) in field.
3. Preparation & digitization of different topography map with the help of GIS software.
4. Utility mapping using Ground Penetrating RADAR.

### **Caters to**

BTech, MTech, Skills for Success (SFS), Domain Courses (All UG course including BSc and MSc), Diploma, and World Skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

### **Market Linkages**

The cardinal goal of the facility is endowing the students with required skill sets. At the outset, the students will be able to choose path of entrepreneurship or excel in their job profile.

### **Relevant Sustainable Development Goals**

Industry innovation and infrastructure (9)

Quality Education (4)

Partnership for Goals (17)

# CoE in Paramedics

## Optometry and Ophthalmology: HPCL



The University has established an action learning facility for Optometry and Ophthalmology learning, in colfacilityoration with Hindustan Petroleum Corporation Limited (HPCL). The facility is equipped with state-of-the-artophthalmic instruments to cater to the optometrystudents.

### **Training Manuals**

The following manuals are provided,

1. Handling of all ophthalmic instruments
2. Using the instruments to provide essentialdiagnosis for any visual impairment.
3. Utilizing the resources to cater to the community through facility.

### **Aim of the action learning facility**

To enable students to acquire a fundamental, thorough, and in-depth understanding ofophthalmic instrumentation and to know the proper implementation of the instrumental knowledge to carry out essential diagnostic challenges.

### **Objectives**

To deliver experience learning, practicalknowledge, and practice-based pedagogy on thefollowing:

1. Ophthalmic instrument working principle
2. Clinical significance of the instruments in real life
3. Calibration and working procedure of eachophthalmic instrument
4. Role of the instruments in diagnosis and differential diagnosis of any visual impairment

### **Outcomes**

1. Ability to diagnose any ocular pathologyusing the instrumentation skills
2. Enhancing Employability and Entrepreneurship

### **Caters to**

M. Sc. Optometry, B. Sc. Optometry, Skills for Success (SFS), Certified Ophthalmic Assistant (COA) and Certified Ophthalmic Surgical Assistant (COSA). The facility serves as state-of-the- art facility for research scholars: PhD and Research fellows.

The students will be able to carry out preliminary,detailed and diagnostic ocular investigations of any ocular pathology using the ophthalmic instruments.

### **List of Major equipment**

1. Fundus Camera
2. Humphrey Visual Field Analyzer(HFA/HVF)
3. Retinoscope (Streak)
4. Ophthalmoscope (Direct)
5. Keratometer (Manual & Automated)
6. A-Scan Biometry

7. B-Scan Ultrasound
8. Slit-Lamp Biomicroscope
9. Non-Contact Tonometer
10. Ophthalmic Chair-Unit
11. Manual Lens Edger
12. Synaptophore

### **Market Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies pertaining to successful ocular diagnosis. The facility has tie-ups with Ophthalmic giants/ hospitals like Essilor Pvt.LTD, Eye-Q Super specialty Eye Hospital (Gurgaon), S.C.B. Medical College and Hospital(Cuttack), Trilochan Netralaya (Sambalpur), KarVision eye Hospital (Bhubaneswar), Ruby Eye Hospital (Berhampur), Shankara Eye Hospital (Berhampur), ECOS Eye Hospital (Berhampur), etc. which helps a student in channeling the skill in a proper direction in their career. Adapting to the culture of continued learning in these facilities, the students get oriented to excel in job prospects and also, they become qualified to opt for entrepreneurial professions.

### **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)



## Central Facility



The University has established an action learning facility Central Facility for routine examination of clinical specimens. This facility consists of advanced equipment's such as Automated electrolyte analyzer, Binocular Microscopes with fungal resistant glass, CBC analyzer, HbA1C analyzer, ELISA reader, Microtomy station, Auto Coagulometer with double channel.

### **Training Manuals**

The following manuals are provided,

1. Handling of all facility equipment's
2. Manual for routine diagnostic tests
3. Analysis of body fluid, waste products and tissue samples
4. Manual for microbial and parasitic facility diagnosis
5. Manual for autopsy and biopsy samples
6. Facility manual for Biomedical facility investigations

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of Facility equipment for the diagnosis of disease and treatment plan.

### **Objectives**

To enable perspective learning, practical knowledge, and training pedagogy on the following:

1. Operation of manual and automated equipment's
2. Preparation of media, reagents, stains and slides for diagnosis of disease
3. External quality and internal quality maintenance and calibration of diagnostic tests
4. Pathological investigation for diagnosis of disease
5. Facility investigation for post operative care
6. Sample analysis to find the root cause of disease and their diagnosis
7. Prevention and control of infectious disorders
8. Basics of blood transfusion and related investigations
9. Investigation of coagulation disorder and auto immune disorders

### **Outcomes**

1. The student will be able to operate manual and automated medical diagnostic equipment's
2. Conduct research investigation in health care industries
3. Perform the activities of Facility scientist in programs organized by the government e.g. malaria eradication, filaria eradication, RNTPC, etc.
4. Epidemiological disorder analysis
5. Will be able to find out the infectious agents in hospital and diagnostic division
6. To operate blood bank equipment's and organize blood donation camps
7. To diagnose immunological disorders (quantitative and qualitative)
8. Analysis of biopsy and autopsy samples

9. Find out the specific microorganisms causing infection and its suitable antibiotics
10. Sterilization of equipment for infection control
11. Biomedical waste management
12. Find out blood related disorders, anemia, leukemia
13. Identification of parasite and infection control policy
14. Will be able to diagnose metabolic disorder and physiological disorder
15. Enhancing Employability and Entrepreneurship in diagnostic division

### **Caters to**

M. Sc. MLT, M. Sc. CMB, B. Sc. MLT, B. Sc. CMB, B. Tech Biotechnology, B. Pharm, Skills for Success (SFS) and Domain Courses (All UG course including BSc), Diploma, and World Skills participants.

The students will be able to apply the techniques and methods in diagnostic sector. The facility also provides exposure to the World Skill participants for hands on training.

### **List of Major equipment**

1. Automated Electrolyte Analyzer
2. Binocular Microscopes with fungal resistant glass
3. CBC Analyzer
4. Hemocytometer
5. HbA1C Analyzer
6. ELISA Reader
7. Tissue Floating Station
8. ESR Automated Analyzer
9. Auto Coagulometer with double channel
10. Microtome
11. Incubator with temp regulator
12. Hot Air Oven with temp regulator
13. Centrifuge
14. Laminar Air Flow
15. Autoclave
16. Water Bath

## **Market Linkages**

The primary objective of the Central facility is to facilitate clinical specimen investigations. It has strategic tie-ups with NABL accredited facility from in and outside Odisha, which includes all Government Medical colleges of Odisha and private medical college and hospitals such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahman and Narayana Multi-speciality Hospital (Jamshedpur), Vijaya Diagnostic Centre (Hyderabad), Capital Hospital (Bhubaneswar), Prolife Diagnostics (Bhubaneswar), Gen X Diagnostic Center (Bhubaneswar), Max Diagnostic Centre (Cuttack), Hi-tech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), Sparsh Hospital (Bhubaneswar), etc.

The training provided in this facility scales up the employability and entrepreneur ability of the students.

## **Relevant Sustainable Development Goals**

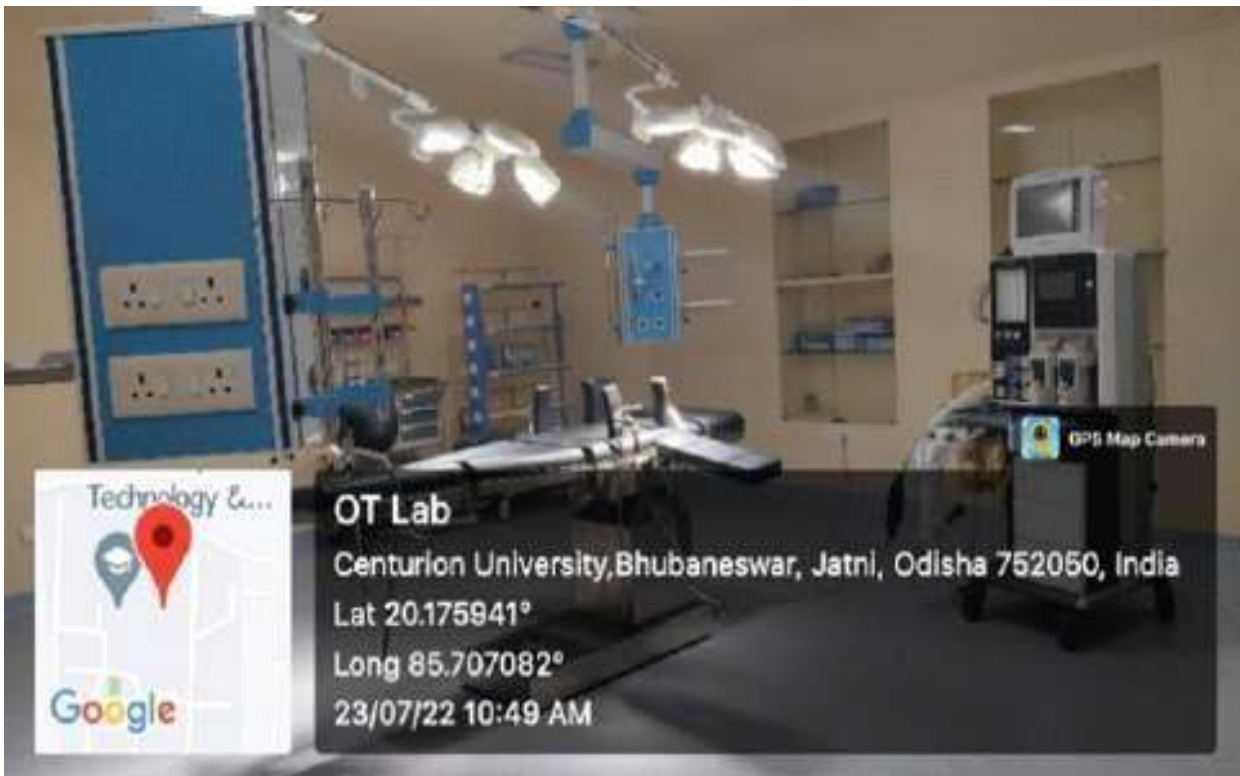
Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)



## Operation Theatre Facility



The University has established an action learning for Operation Theatre (OT) techniques. It is equipped with state-of-art OT facility consisting of surgical table, anaesthesia machine, vital signs monitor, electrosurgical cautery machine, electric suction machine, C- arm machine to enable students to handle tools in the Operation Theatre.

### **Training Manuals**

The following manuals are provided, Manual of Anesthesia and Operation Theatre  
Operation Theatre Techniques and Management Operating Room protocols

### **Aim of the action learning facility**

To enable students to acquire a fundamental, thorough, and in-depth understanding of surgical procedures and to be competent enough to elevate the quality of patient care offered during the Surgical conditions.

### **Objectives**

To provide students with hands-on learning and practice-based pedagogy on the following:

1. Generic learning including scrubbing, gowning, safety principles
2. Pre-operative preparations
3. Disinfection and sterilization of OT
4. Preparing the OT for procedure-specific surgical supplies
5. To ascertain that the OT requirements are securely connected before the surgery

### **Outcomes**

1. Evaluating, monitoring, and assessing operation theatre situations
2. Playing an indispensable role in maintaining supply equipment's for surgery
3. Ensuring proper recovery of the patients as post operative care
4. Assist in ICU, Central Sterile Supply department and during disaster and emergency situations
5. Play pivotal role in patient data collection, catheter insertion, airway management, monitoring of regional and peripheral nerve blockades during surgery
6. Perform inter-operative monitoring and postoperative procedures
7. Enhancing Employability

### **Caters to**

B. Sc. OTT, B. Sc. AT, B. Sc. EMT, Skills for Success (SFS) and Domain Courses (All UG course including BSc). The facility also provides exposure to the World Skill participants.

To enable the students to support anesthetists and surgeons during surgical procedures.

### **List of Major equipment**

1. Surgical table
2. Anaesthesia Machine
3. Vital signs monitor
4. Electrosurgical cautery machine
5. Electric suction machine

6. C- arm machine
7. Central Gas and suction
8. Back instrument table
9. Utility cart
10. Medical Cabinetry
11. Endoscopy tower
12. Baby Care Panel
13. Central Sterile Unit

### **Market Linkages**

The major focus of the facility is to provide students with the necessary knowledge, abilities, and competences related to OT techniques. The facility has collaborative tie-ups with NABL accredited laboratories such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahmanand Narayana Multispeciality Hospital (Jamshedpur), Hitech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), etc.

Students will be able to choose a career of better employability, and succeed in their job profile through the training provided in this learning facility.

### **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)

## Physiotherapy Facility



The University has established an action learning facility for Physiotherapy techniques. It consists of the most up-to-date equipment's such as LASER, traction unit, High Frequency Modalities (Short Wave Diathermy, Long Wave Diathermy, Therapeutic Ultrasound), Medium Frequency Modalities (Inferential Therapy), Low Frequency Modalities (Transcutaneous Electrical Nerve Stimulation), muscle stimulator, exercise therapy unit, suspension therapy unit for patient rehabilitation.

### **Training Manuals**

The following manuals are provided,

1. Handling of all facility equipment.
2. Essential diagnosis and treatment for impairments related to Orthopedic, Neurological, Cardiology, Pulmonology, Gynecology and Sports related conditions

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of Physiotherapy equipment pertaining to patient- assessment, evaluation, treatment planning and execution.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. Learning of working principle of the physiotherapy equipments
2. Understanding physiological and bio- mechanical alteration of the body's mechanical structures with respect to conditions

### **Outcomes**

1. Diagnose, evaluate and treat Musculo skeletal abnormalities
2. Diagnosis and treatment of neurological abnormalities from infant to geriatric stage
3. Diagnose and treat Cardio Thoracic conditions
4. Diagnose, evaluate and treat sports related rehabilitation
5. Enhancing Employability and Entrepreneurship

### **Caters to**

Bachelor of Physiotherapy, Skills for Success(SFS).

The students will be able to carry out pertinent clinical evaluations and design patient management plans for electrotherapy and activity therapy.

### **List of Major equipment**

1. LASER
2. Traction Unit
3. High Frequency Modalities - Short Wave Diathermy, Long Wave Diathermy, Therapeutic Ultrasound
4. Medium Frequency Modalities: Inferential Therapy
5. Low Frequency Modalities: Transcutaneous Electrical Nerve Stimulation, Muscle Stimulator
6. Exercise Therapy Unit



## 7. Suspension therapy Unit

### **Market Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies to improve a patient's mobility, function, and overall well-being. The objective is to improve the patient's physical health, quality of life, and general wellness. The facility also has industrial tie-ups with NABL accredited facility from in and outside Odisha, which includes all Government Medical colleges of Odisha and some of the renowned private medical college and hospitals.

Students will be able to choose a career of entrepreneurship, better employability, and succeed in their job profile through the training provided in this learning facility.

### **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)

## Radiology and Imaging Facility



The University has established an action learning facility for Radiology and Imaging techniques. It is equipped with X-Ray Machine to diagnose or examine diseases of the human body. The facility is established as per the AERB guidelines.

### **Training Manuals**

The following manuals are provided,

1. Handling and Operating X-Ray Machines
2. Processing the Image in Dark Room and CR System
3. Learning about Radiation protection and Hazards

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of X-ray techniques and appropriate patient positioning for radiography procedures.

### **Objectives**

To provide expertise, practical understanding, and hands-on learning on the following:

1. Handling X-ray Equipment for Routine Radiography
2. Processing exposed X-Ray films.
3. Calibration and working principle of X-Ray Machine
4. Room layout of dark room and X-Ray room
5. Carry out different positionings for X-Ray
6. Special procedure in Diagnostic radiology

### **Outcomes**

1. Adapting to new clinical skills and imaging technology
2. Able to perform image processing
3. To ensure radiation protection and Quality Assurance
4. Enhancing Employability and Entrepreneurship

### **Caters to**

B. Sc. Medical Radiation Technology, Skills for Success (SFS), DMRT, Certified ECG Technician. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to position the patient for X-Ray and different diagnostic procedures using this facility.

### **List of Major equipment**

1. CR READER
2. Laser Film Printer
3. X-Ray Machine (Fixed) 100mA Unit
4. X-Ray Machine (Portable) 30mA Unit
5. CR Cassette

## **Market Linkages**

Radiology and Imaging facility is concerned with the direct administration of radiation in disease diagnosis and injury assessment. It has industrial tie ups with both regional and national NABL-accredited facilities such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahmanand Narayana Multi-speciality Hospital (Jamshedpur), S. C. B. Medical College and Hospital (Cuttack), Vijaya Diagnostic Centre (Hyderabad), Prolife Diagnostic (Bhubaneswar), Gen X Diagnostic Center (Bhubaneswar), Max Diagnostic Centre (Cuttack), Hitech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), Sparsh Hospital (Bhubaneswar), Nidan Diagnostic & Research Center (Bhubaneswar and Berhampur), etc. The training provided in this facility scales up the employability and entrepreneurial ability of the students.

## **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)

## Cardiac Care Facility





The University has established an action learning facility on Cardiac Care techniques. It is equipped to monitor cardiopulmonary disorders, and consists of TMT machine, ECG machine and Cardiac care beds with patient privacy cabins in order to monitor the functioning of the patient's heart and heart rate.

### **Training Manuals**

The following manuals are provided,

Handling and Operating Cardiac Care equipment's

### **Aim of the action learning facility**

To provide students with the fundamental, extensive knowledge required to monitor patients in a healthcare setting for any kind of cardiac issues, pre/ post-surgery care. Additionally, students will be able to identify cardiac dysrhythmias and interpret basic ECGs.

### **Objectives**

To provide students with hands-on learning and practice-based pedagogy on the following:

1. Preparation of patients for various heart-related operations/surgery
2. Assisting Surgeons in embedding pacemakers
3. Monitoring Patients During Surgeries
4. Undertaking Electrocardiograms and Cardiac Stress Tests
5. Maintaining and Handling Instruments used for monitoring irregular heartbeats.

### **Outcomes**

1. Independently handle the latest technology relevant to heart diseases, diagnosis & treatment
2. Perform invasive and non-invasive diagnostic examinations and therapeutic interventions of the heart and/or blood vessels under supervision
3. Identify and know the instruments and equipment used in different procedures
4. Enhancing employability

### **Caters to**

B. Sc. Medical Radiation Technology, Skills for Success (SFS), DMRT, Certified ECG Technician. The students will be able to operate important and relevant instruments required for monitoring the heart and pulse rate.

### **List of Major equipment**

1. TMT Machine
2. ECG Machine
3. Oxygen Cylinder and Oxygen Supply
4. BP Monitor
5. Cardiac Care Beds
6. Patient Privacy Cabin
7. Central Sterile Service Unit
8. Sphygmomanometer (Stand type/ Dial type/Digital)
9. First aid kit

## **Market Linkages**

The cardinal goal of the learning facility is endowing students with required skills and competencies pertaining to cardiac care techniques. The facility has industrial tie ups with both regional and national NABL-accredited facilities or laboratories such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahmanand Narayana Multispeciality Hospital (Jamshedpur), S. C. B. Medical College and Hospital (Cuttack), Vijaya Diagnostic Centre (Hyderabad), Prolife Diagnostic (Bhubaneswar), Gen X Diagnostic Center (Bhubaneswar), Max Diagnostic Centre (Cuttack), Hitech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), Sparsh Hospital (Bhubaneswar), Nidan Diagnostic & Research Center (Bhubaneswar and Berhampur), etc. The training provided in this facility scales up the employability ability of the students.

## **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)

## Dialysis Facility



The University has established an action learning facility for Dialysis technique which allows students to gain knowledge and skills in handling patients with various genito-urinary conditions requiring dialysis unit.

### **Training Manuals**

The following manuals are provided, Manual for Dialysis Technician Maintenance of Dialysis Machine

### **Aim of the action learning facility**

To enable students to gain basic, comprehensive and in-depth understanding of Dialysis unit.

### **Objectives**

To provide students with hands-on learning and practice-based pedagogy on the following:

1. Setting-up of a dialysis unit
2. Acquire knowledge of the various genitourinary disorders

### **Outcomes**

1. Handling of dialysis instruments
2. Assess pre dialysis patient and monitor the patient during the procedure
3. Monitor patients receiving hemodialysis, peritoneal dialysis, or pre- or post-renal transplant in an efficient manner
4. Understand the signs and symptoms of transplant rejection
5. Understanding of different medications, their dosages, and the best route for administration to patients with genitourinary problems
6. Enhancing Employability

### **Caters to**

B. Sc. EMT, B. Sc. OTT, B. Sc. AT, it also provides exposure to the Skill students for hands on training. It enables students to Acquire knowledge on specific treatments such as hemodialysis, peritoneal dialysis, kidney transplant, lithotripsy, renal artery embolism

### **List of Major equipment**

1. NIPRO - DIAMAX Dialysis Machine
2. RO Plant
3. Dialysis Bed
4. IV/IM Transfusion set
5. Oxygen Cylinder and Oxygen Supply
6. Central Sterile Service Unit
7. Sphygmomanometer (Stand type/ Dial type/Digital)
8. 4 Dialysis Bed
9. Patient Privacy Cabin

## **Market Linkages**

The facility's primary goal is to prepare the students to handle critical cases pertaining to Dialysis care. It has collaborative tie-ups with NABL accredited laboratories from in and outside Odisha, which includes all Government Medical colleges of Odisha and private medical college and hospitals such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahmanand Narayana Multispecialty Hospital (Jamshedpur), Hi-tech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), etc.

Students will be able to choose a career with better employability, and succeed in their job profile through the training provided in this learning facility.

## **Relevant Sustainable Development Goals**

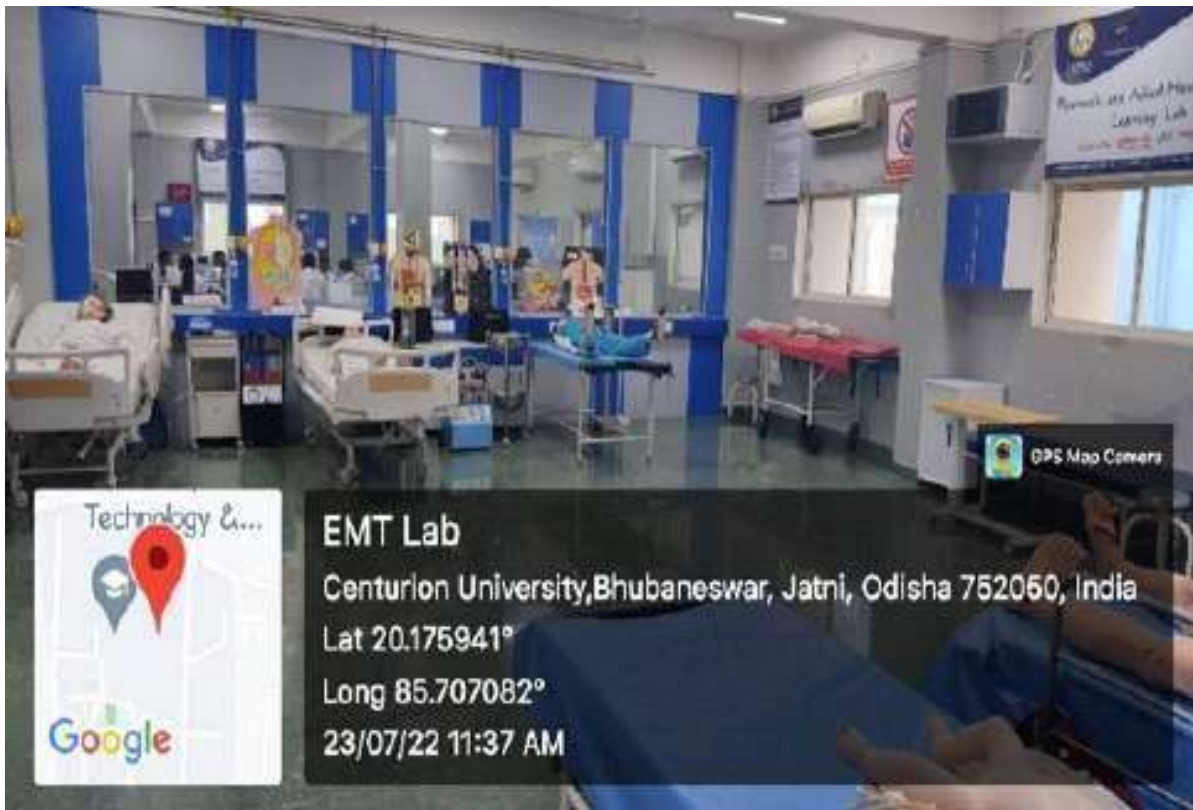
Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)



## Emergency Medicine Technology Facility



The University has established an action learning facility for Emergency Medical Techniques. It consists of advanced equipment's like electronic infant CPR, adult CPR, training Manikins, artificial blood transfusion system to train and create efficient medical resource personnel in the field of Emergency Medical Services

### **Training Manuals**

The following manuals are provided,

- Manual of Critical Care and Emergency Medicines
- Handbook of Emergency Medicine

### **Aim of the action learning facility**

To enable students with fundamental, comprehensive, and in-depth knowledge of the skills and expertise they require to deal with patients who are in need of urgent medical attention. It engages students in in-depth understanding of emergency care during critical conditions.

### **Objectives**

To provide students with hands-on learning and practice-based pedagogy on the following:

1. Recognizing common, urgent and emergent problems in Emergency department
2. To exhibit the requisite comprehensive understanding of emergency medicine
3. To demonstrate professionalism in emergency patient care

### **Outcomes**

1. Competent to work in the field of Prehospital Emergency
2. Handle accident and critical conditions
3. Efficiently manage Medical and Trauma Emergencies
4. Handle challenging situations and improved decision-making skills in healthcare
5. Enhancing Employability

### **Caters to**

B.Sc. EMT, B.Sc. OTT (Operation Theatre Technology), B.Sc. AT (Anaesthesia Technology), SFS (Skill for success). The facility also provides exposure to the World Skill participants for hands on training.

The students are trained with the information, skills, and attitude needed to address a variety of clinical issues in emergencies.

### **List of Major equipment**

1. Electronic infant CPR
2. Adult CPR
3. Elimination system (in Critical care)
4. Training Manikins (male, female, geriatric, pediatric, burn and accidental injury)
5. Different types of Bed Pan
6. Ambu Mask

7. Artificial Blood Transfusion
8. IV Transfusion
9. IM/ IV injection models
- 10.Skeletal System
- 11.Weighing machine
- 12.BMI measurement
- 13.Oxygen Cylinder and Oxygen Supply
- 14.Suction Machine
- 15.Community Bag
- 16.Infusion pump
- 17.Glucometer
- 18.Central Sterile Service Unit
- 19.Sphygmomanometer (Stand type/ Dial type/Digital)
- 20.First aid kit

### **Market Linkages**

The facility's primary goal is to prepare the students to handle critical care situations within a stipulated time limit. It has collaborative tie-ups with NABL accredited facilities such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahmanand Narayana Multispeciality Hospital (Jamshedpur), Hi-tech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), etc.

Students will be able to choose a career of better employability, and succeed in their job profile through the training provided in this learning facility.

### **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)

## Intensive Care Unit Facility





The University has established an action learning facility for operating an Intensive Care Unit (ICU). It is equipped with defibrillator, infusion pump, ventilator, BiPAP and CPAP system to prepare technicians to be skilled in critical care and provide healthcare support.

### **Training Manuals**

The following manuals are provided,

- Handling of facility equipment's in an Intensive Care Unit.
- Essential monitoring, care and treatment for patients in Intensive Care Unit

### **Aim of the action learning facility**

To provide students with a fundamental, comprehensive, and in-depth understanding of the care needed for critically ill patients in intensive and specialized medical and nursing settings.

### **Objectives**

To provide hands on knowledge, experiential learning and practice linked pedagogy on the following:

1. To manage complicated clinical issues that arise in the ICU
2. To understanding the contemporary medical advancements that are used in ICUs
3. To gain expertise in handling medical emergencies

### **Outcomes**

1. Prioritizing patients and identify emergencies that need quick response
2. Deliver the best possible treatment with sincerity, integrity, and compassion
3. Respond quickly to emergencies like heart attacks, falls, childbirth, gunshot wounds, assaults, and automobile accidents
4. Prepare, update and disseminates unit reports, physician orders and patient records
5. Enhance Employability

### **Caters to**

B. Sc. OTT, B. Sc. AT, B. Sc. EMT, Skills for Success (SFS) and Domain Courses (All UG course including BSc). The facility also provides exposure to the World Skill participants for hands on training.

The students will be able to set up clinical priorities that will improve patient care and the efficiency of the clinical service.

### **List of Major equipment**

1. Defibrillator
2. Infusion Pump
3. Syringe Pump
4. Ventilator
5. BPAP System
6. CPAP System
7. Patient Monitor
8. Medical Trolley
9. Suction Apparatus
10. Cardiac Bed
11. Central Sterile Service Unit
12. Sphygmomanometer (Stand type/ Dial type/Digital)
13. First aid kit



14. Patient Privacy Cabin

15.2 ICU beds

### **Market Linkages**

The major focus of the facility is to provide students with the necessary knowledge, abilities, and competences related to ICU techniques. It has collaborative tie-ups with NABL accredited laboratories such as Manipal Hospitals (Bengaluru), Apollo Hospitals (Bhubaneswar), Institute of Medical Sciences and SUM Hospital (Bhubaneswar), Ashwini Group of Hospitals (Cuttack and Bhubaneswar), Brahmanand Narayana Multispeciality Hospital (Jamshedpur), Hitech Medical College and Hospital (Bhubaneswar and Rourkela), Kalinga Hospital (Bhubaneswar), etc.

Students will be able to choose a career of better employability, and succeed in their job profile through the training provided in this learning facility.

### **Relevant Sustainable Development Goals**

Good Health & Well Being (3)

Quality Education (4)

Partnership for Goals (17)

# CoE in Agriculture

## Food Processing Facility



Food Processing Facility is research cum experimental facility of the Department of Agricultural Engineering of the University. It has been setup with an objective of giving hands on training in food product development and demonstrate food processing principles and preservation methods to the students of Engineering and Science disciplines.

### **Aim of the action learning facility**

To facilitate the students to understand the principles of food preservation and provide them with hands-on working in the food processing domain.

### **Objectives**

The students will be gaining experience and knowledge in the following techniques:

1. Determine engineering properties of food materials.
2. Determine the nutrient composition of the food.
3. Determine the vitamin C, antioxidant, and acid content of food products.
4. Prepare value-added products from fruits and vegetables.
5. Operate all kinds of dryers and perform drying kinetics studies.
6. Identifying different types of packaging materials and their properties.

### **Outcomes**

1. Development of deep understanding of the concepts of food preservation and skill to apply them in industries/research.
2. Able to independently handle the sophisticated equipment related to food processing.
3. Learn to follow SOPs and safety guidelines while working in facility.
4. Develop skill for preparation of value-added food products.
5. Able to perform chemical analysis of food products.

### **Caters to**

B. Tech Agriculture, B.Sc Agriculture, M.Sc Zoology

### **List of Equipment**

1. Hot air tray dryer
2. Rotary dryer
3. Freeze dryer
4. Spectrophotometer
5. pH meter
6. Colorimeter
7. Hot air oven
8. Titration setup
9. Soxhlet extractor
10. Autoclave
11. Centrifuge

12. Microwave oven
13. Microwave assisted extraction setup
14. Clevenger apparatus
15. Table top oil expeller machine
16. Heating mantle
17. Brix meter

### **Market Linkages**

The facility is used by the food processing domain students outside the campus to get hands-on training in food processing. Students working in facility are also exposed to visits to Gram Tarang Foods to get industrial experience and carry out internships/projects. It can be used for drying and packing of fresh fruits and vegetables.

### **Relevant Sustainable Development Goals**

Zero Hunger (3)

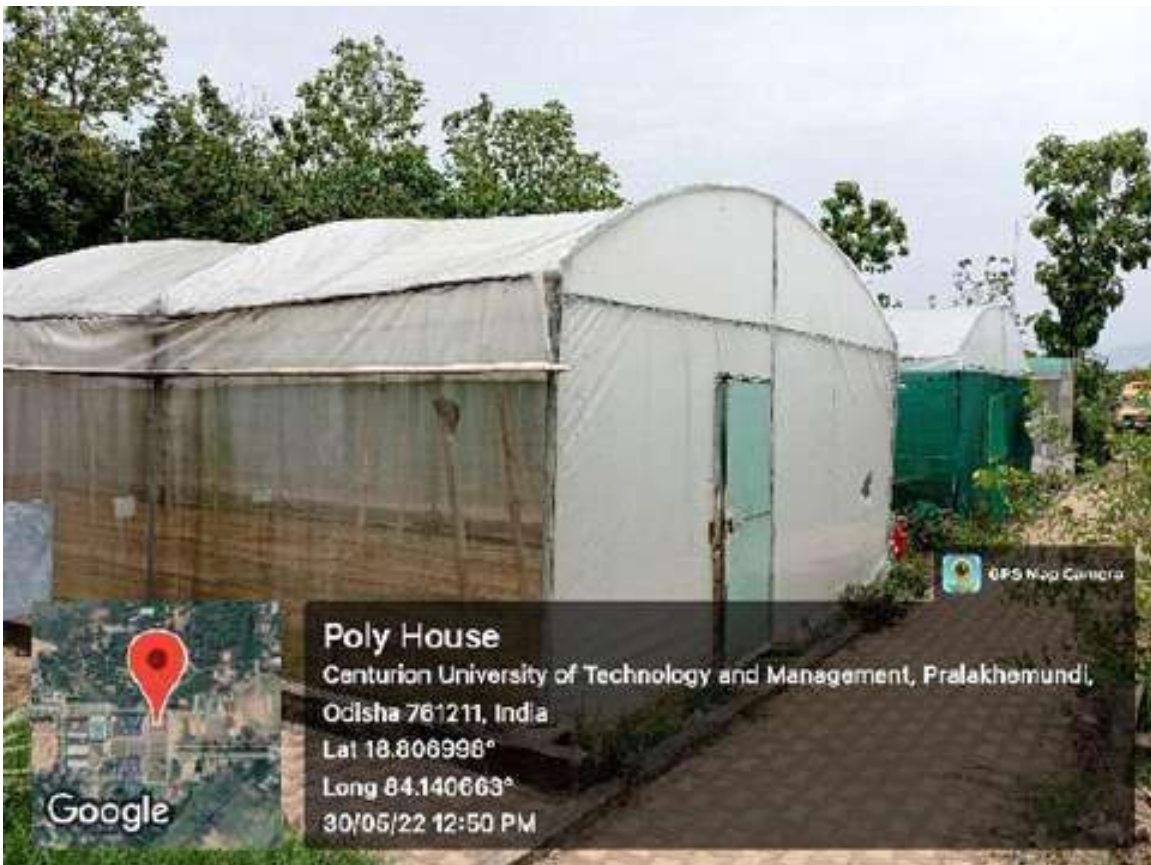
Responsible Consumption and Production (12)

Quality Education (4)

Partnership for Goals (17)



## Protected Cultivation (Green House)





Under the unit consists of four poly houses measuring around 100 sqm each; two out of them have established gerbera plants and the other was prepared for the cultivation of parthenocarpic cucumber. However, this unit also consists of 10 small polyhouses measuring around 10 sqm each, aiming to represent different exotic crops cultivation through automation. Recently, one of the polyhouse was automated and work is progressing as destined. On the other hand, this unit additionally consists of open field and a portion which is presently half of the field was occupied with tube rose and sweet corn where another half of the field was laid with mulching beds for the cultivation of vegetables.

### **Aim of the action learning facility**

To enable students to get both basic and in-depth understanding different types of polyhouse, application of nutrients, water use efficiency and micro climate system.

### **Objectives**

Students will be able to do hands on, on the following,

1. To acquire practical knowledge on production of year-round and off-season production of cut flowers and high value vegetable crops.
2. To learn the maintenance and functioning of poly house.
3. To acquire practical knowledge in cultivation of seasonal vegetables using mulching films.

### **Outcomes**

1. Students shall learn the production technology of gerbera-a high-tech cut flower under protected environment. Students shall acquire the skill to produce colored capsicum under protected environment. Students shall gain hands on experience in the cultivation of seasonal vegetables and cereals under poly mulching.

### **Caters to**

B.Sc.(Ag.), M.Sc.(Ag.) and B.Tech.(Ag.) Skills for success and domain courses. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out Agricultural Experiential Learning Programme (AELP) for promoting professional skills and knowledge through hands on experience, building confidence and ability to work in growing the crops in a controlled environment. This means that the temperature, humidity, light and such other factors can be regulated as per requirement of the crop. This assists in a healthier and a larger produce.

### **Market Linkages**

The students will be able to choose path of entrepreneurship or excel in their job profile in some big companies.

### **Relevant Sustainable Development Goals**

Climate action (13)

Quality Education (4)

Partnership for Goals (17)

## Soil Testing Facility



The University established a soil testing facility inside Parlakhemundi campus. Soil testing is a rapid chemical analysis to access available nutrient status of the soil and includes interpretation, evaluation and fertilizer recommendation based on the result of chemical analysis and other considerations.

### **Aim of the action learning facility**

To enhance the practical knowledge of students to get both physical and chemical analysis of different types of soil to access available nutrient status.

### **Objectives**

Students will be able to do hands on, on the following,

1. Grouping of soil into classes relative to the nutrient level.
2. Predicting the probability of getting a profitable response to the fertilizers.
3. To provide the basis for fertilizer recommendation
4. To test the use of plant nutrients based on soil test crop response.

### **Outcomes**

1. Conversant in using instruments and increase skill
2. Ability to test different types of soils
3. Able to use of various precision measuring instruments
4. Able to know different parameter of soil
5. Ability to calculate fertilizer recommendation as per soil test report

### **Caters to**

B.Sc Agriculture, M.Sc Agriculture, Skills for success and domain courses participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to understand soil testing will ensure benefits at many levels, for farmers it will be an inexpensive option. On the other hand, the students will learn about soil testing as a management tool to determine PH and nutrient concentration, they will also understand the importance of protecting the soil from contamination.

### **List of Equipment**

1. Spectrophotometer
2. Flame photometer
3. Nitrogen distillation unit
4. pH and Electrical conductivity meter
5. Mechanical shaker

## **Market Linkages**

The cardinal goal of the facility is endowing the students with required skill sets to learn soiltesting skill and use it for market requirement. At the outset, the students will be able to choose path of entrepreneurship or excel in their job profile.

## **Relevant Sustainable Development Goals**

Quality Education (4)

Clean Water and Sanitation (6)

Partnership for Goals (17)



## Farm Machinery Facility





The farm machinery facility is facilitated with basic and advanced farm equipment. This facility has agricultural machines like tractors, power tillers and allied tools like ploughs, sowing/planting/transplanting machines, power weeder, sprayer, reapers and thrashers. The smart farm machinery chamber is sponsored by Dassault software like SOLIDWORKS and CATIA.

### **Objectives of the Facility**

To enable students,

1. Learn basic and advanced techniques used in agricultural machinery
2. Learn the operation and maintenance of basic and advanced agricultural machinery
3. Compete in the field of farm machinery and power engineering.
4. Develop sensor-based smart agricultural machines or equipment for the farmer community.

### **Outcomes**

The students

1. Being able to design and operate the agricultural machine.
2. Being skilled in developing the 3D model and simulating the agricultural machine.
3. Being able to fabricate the agricultural machine.
4. Wide scope of Research and Development and awareness on the same.

### **Caters to**

BTech, MTech, Skills for Success (SFS) and Domain Courses. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry on hands on experiential learning on machine tools like tractors, hoes along with fault diagnostics and condition monitoring.

### **List of Equipment**

1. Tractors
2. Power tillers
3. Hoe
4. Dassault system tools like CATIA
5. Automation tools like sensors and actuators

### **Relevant Sustainable Development Goals**

Quality Education (4)

Life on land (15)

Partnership for Goals (17)

# CoE in Fisheries

## Aquaculture



Aquaculture (less commonly spelled aquiculture also known as aquafarming, is the controlled cultivation or farming of aquatic organisms such as fish, crustaceans, mollusks, algae. It also includes other organisms of value such as aquatic plants. The University has established an action learning on Aquaculture to which is equipped with all necessary instruments and chemicals. The following section details more on the same,

### **Aim of Aquaculture Facility**

To enable the students to get theoretical and practical understanding of various equipment, aquaculture system and its advanced techniques.

### **Objectives**

1. To standardize the culture as well as feeding strategies to maximize the growth potential of fish.
2. Protocol for short cycled and compatible species to be reared for more production with specific crop period.
3. To aware the basic and depth understanding of semi and super intensive aquaculture system

### **Outcomes**

At the completion of the practical courses during different semester, the successful students will have:

1. Increased practical knowledge to work on different aquaculture field.
2. Knowledge how to handle the culture and production technically.
3. Developed professional skill to guide the entrepreneurs and stake holders
4. Scientific knowledge to be a concerned human resources and entrepreneur.

### **List of equipment**

1. Simple microscope
2. Conductivity meter
3. Secchi disk
4. Weighing balance
5. Imhoff cone
6. Refractometer
7. pH meter
8. Magnetic stirrer

### **Caters to**

It caters to the needs of the courses of Bachelor of Fisheries Science and MSc Zoology

### **Relevant Sustainable Development Goals**

Quality Education (4)

Life below Water (14)

Partnership for Goals (17)

## Aquatic Animal Health Management Facility



Aquatic Animal Health Management (AAHM) Action Learning Facility provides students with hands-on training in aquatic animal health and its management. The AAHM facility is equipped with all the basic necessities for conducting microbiological and immunological research.

Aims: To impart practical knowledge to the students through experiential learning in the diagnosis, prevention and mitigation of fish and shellfish diseases

### **Objectives**

1. To impart knowledge and hands-on training on the basic principles of microbiology
2. To understand the gross and clinical signs of different fish and shellfish diseases
3. To understand different fish disease diagnostic techniques
4. To formulate prophylactic and therapeutic strategies for pathogenic diseases
5. To carry out research on common microbial, nutritional and environmental diseases associated with fish and shellfish
6. To conduct trainings and awareness program for the fish farmers
7. To disseminate information regarding the emerging diseases in aquaculture

### **Outcomes**

Students will get,

1. Familiar with the basic microbiological tools and techniques employed for fish disease diagnosis
2. Trained by 'learning by doing approach' to gain insights in fish pathology and disease diagnosis
3. Learn to spread awareness regarding disease risks, health management in aquaculture through field surveys and farmer-student interactions
4. Understanding of different microbiological diseases of fish and shellfish

### **Caters to**

B.F.Sc, M.Sc (Zoology) List of Equipment:

1. Laminar Air Flow
2. Incubator
3. Hot Air Oven
4. Microtome
5. Compound microscope
6. Refractometer
7. Water Bath
8. Deep freezer
9. Refrigerator
10. Autoclave
11. Digital pH meter
12. Digital Colony Counter
13. Conductivity Meter
14. Electronic Weighing Balance
15. Homogenizer
16. Distillation Unit



**Relevant Sustainable Development Goals**

Quality Education (4)

Life below Water (14)

Partnership for Goals (17)

## Fish Processing Technology Facility



The university has set up an action learning facility on Fish Processing Technology. The facility is outfitted with a range of equipment and technologies in order to handle, preserve, process, and produce value-added fish products and by-products in a hygienic manner.

### **Aim of Fish Processing Technology Facility**

To enable students hands-on experience using hygienic fish processing and preservation techniques in order to produce high value-added fish products and byproducts.

### **Objectives**

The following are the objectives,

1. To study the characteristic of fish, its nutritional quality and relation to spoilage.
2. To study about different fish preservation techniques to reduce post-harvest loss.
3. To develop different value-added fish and shellfish product.
4. To develop fish processing waste into valuable fish by-products.
5. To explore different area for better utilization of by-catch and low value fish.

### **Outcomes**

The following are the outcomes,

1. Understand the preservation techniques to reduce spoilage in fish and minimize post-harvest loss.
2. Different processing methods for fish and shellfish.
3. Different by-product from fish processing waste.
4. Development of low-value fish and by-catch into high value product.

### **List of equipment**

1. Fish Deboner Machine
2. Fish Vacuum Packaging Machine
3. Fish Storage Freezer

### **Market Linkages**

The knowledge base enables the students to up-skill in the area of Fishing technology and it opens avenue for entrepreneurship.

### **Relevant Sustainable Development Goals**

Quality Education (4)

Life below Water (14)

Partnership for Goals (17)

# Fisheries Navigation and Engineering



The main objectives of this facility are to undertake teaching, research and extension in the field of Fish navigation,

### **Objectives**

1. To give engineering inputs to the Fisheries sector
2. To create the human resource in the field of Fisheries Engineering
3. To undertake research programs in the field of Fisheries Engineering
4. To impart knowledge to undergraduates on the basic concepts of Aquaculture Engineering and Fundamental engineering.
5. To demonstrate various equipment or technologies developed in the department to various stakeholders.

### **Outcomes**

1. Necessity of Refrigeration and Air conditioning in the present scenario
2. Basic principles of surveying and importance of site selection for aquafarm
3. Boat deck layout and layout of marine engine and propulsion system
4. Basic concepts and different types of navigation and seamanship
5. Different types of fishing craft and gears

### **Caters to**

Bachelor of Fisheries Science (BFSc.), MSc Zoology

### **Relevant Sustainable Development Goals**

Quality Education (4)

Life below Water (14)

Partnership for Goals (17)



# CoE in Genetics

## Bio Fertilizer Unit



Bio-fertilizer action learning facility was established as a pilot project which focuses on identification, evaluation and mass production of efficient Bio fertilizer microorganisms viz: Azotobacter, Rhizobium, Bacillus, Pseudomonas and Azospirillum.

Aim of the action learning facility: The main aim of the unit is to promote usage of Bio fertilizer technology among farming community and to impart training to students and farmers for entrepreneurship commercialization.

### **Objectives**

1. To promote professional skills, entrepreneurship, knowledge and marketing skills through hands-on experience and working in project mode.
2. To build confidence through end-to-end approach in product development.
3. To acquire enterprise management capabilities including skills for project development and execution, accountancy, national/ international marketing

### **Outcome**

1. Students after acquiring knowledge of Bio fertilizer production technology can function as skilled practitioner, consultant and as an Agri-entrepreneur.
2. Students can train farmers to follow the ecofriendly practices.
3. Students will be facilitated to understand the basics of bio fertilizers.
4. Students can promote organic farming in the region through technical capacity building of all stakeholders.
5. Students can develop skills about handling, cultivation, and propagation of quality microbial inoculants.

### **Caters to**

The facility caters to the students of Diploma, BTech and MTech: Agriculture and allied areas, Skills for Success (SFS) and Domain Courses (All UG course including B.Sc). The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

### **List of equipment**

1. Digital Balance
2. pH meter
3. Compound Binocular microscope
4. Colony counter
5. Hot air oven
6. Autoclave
7. Laminar air flow cabinet
8. BOD incubator
9. Deep freezer
10. Refrigerator

## **Market Linkages**

The ultimate goal of the facility is to endow the students with required skill sets pertaining to Bio fertilizer production technology. They will be able to choose path of entrepreneurship or excel in their job profile.

## **Relevant Sustainable Development Goals**

Quality Education (4)

Industry innovation and infrastructure (9)

Partnership for Goals (17)

## Genetic Engineering and Genomics facility



The Genetic Engineering and Genomics facility was established in the year 2021. The facility is equipped with State-of-the-art facility instruments required for plant biotechnology, genetic engineering and genomics research. The following section details more on the same.

### **Aim of the Genetics and Genomics Facility**

1. To give hands-on-training to students on molecular biology, plant tissue culture and genetic engineering techniques.
2. To understand the basics of genotyping and sequencing strategies and perform sequencing experiments and data analysis.

### **Expected Outcomes**

1. The students will be able to understand the concept and techniques of genetic engineering and plant tissue and their application in crop plants.
2. Student will be able to identify various omics approach, design and develop experiments to understand and manipulate plant function.
3. Analyse information from plant genomics research and recognize its potential application in crop improvement.
4. They can get job opportunities in agribusiness, private companies, industries, universities and research facilities.

### **Caters to**

B.Sc, Diploma, B.Tech, M.Sc. students. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

The students will be able to carry out experiments in the field of genetics and genomics. They will be industry ready for the industries like the seed, pharmaceutical and others.

### **List of equipment**

1. -80, -20 and 4-degree Refrigerators
2. Laminar Airflows
3. Shaker and Incubator
4. Vortex
5. Microcentrifuge and Mini centrifuge
6. Autoclave
7. Gel Electrophoresis units
8. PCRs
9. UV Transilluminator
10. Oxford Nanopore Sequencer



### **Market Linkages**

The cardinal goal of the facility is to endow the students with the required skill sets pertaining to Molecular biology and Plant Biotechnology. At the outset, the students will be able to choose path of entrepreneurship, research or excel in their job profile.

### **Relevant Sustainable Development Goals**

Quality Education (4)

Industry innovation and infrastructure (9)

Partnership for Goals (17)

## **Plant Molecular Biology Action Learning Facility**



The University established an action learning facility on Plant Molecular Biology with all equipment and facilities.

### **Aim of the action learning facility**

To enable students to get both basic and in-depth understanding of plant molecular biology, plant biotechnology, and plant genomics.

### **Objectives**

Students will be able to do hands on, on the following,

1. Nucleic acid (DNA/RNA) isolation and purification
2. Nucleic acid (DNA/RNA) quantification via spectrophotometry and gel electrophoresis
3. PCR amplification and genotyping.
4. Reverse Transcription and cDNA synthesis
5. Gene expression studies via semi-quantitative and quantitative RT-PCR

### **Outcomes**

1. Conversant in using the wet-facility molecular biology tools
2. Ability to perform facility experiments in the area of plant molecular biology
3. Ability to perform advanced techniques, like cDNA synthesis and gene expression analysis.

### **Caters to**

B.Sc (Ag), B.Sc (Biochemistry), M.Sc (Ag), M.Sc (Botany) Skills for success and domain courses and other skills participants. The facility serves as state-of-the-art facility for research scholars: PhD and Research fellows.

Getting exposed to a well-equipped facility during academics is always highly beneficial for students. In the biotechnology facility, both UG and PG students get to know the principles and operational procedures of the instruments. In addition, they get hands-on experience of different techniques and instruments in the facility as a part of their curriculum. Further, students are offered and encouraged to maximize their practice and training experiences in the biotechnology facility by taking up related domains and being interns in the facility. These experiences and learned skills help them to go for higher studies and also to get good jobs in the industry.

### **List of equipment**

1. Autoclave
2. 4°C refrigerator
3. -20°C deep-freezer
4. -80°C ultra-deep-freezer
5. Shaking incubator
6. Spectrophotometer
7. Conductivity meter
8. pH meter
9. Digital weighing balance

10. UV-transilluminator
11. Water bath
12. Double distillation unit
13. Laminar Air Flow
14. Centrifuge
15. Cooling Centrifuge
16. NanoDrop Spectrophotometer
17. PCR
18. Gradient PCR
19. Real-time PCR
20. iFuge plate spinner
21. MiliQ Molecular grade water purification system

### **Market Linkages**

The cardinal goal of the facility is endowing the students with required skill sets and making them market ready. The skills learned by the students and other trainees in the facility give them a higher notch to compete and perform in the industry. As they imbibe the theory and practical principles of the high-end instruments and molecular techniques, the students and trainees become more specialized in specific technologies, thus, aligning themselves with the industry 4.0 manpower requirements.

### **Relevant Sustainable Development Goals**

- Quality Education (4)
- Industry innovation and infrastructure (9)
- Life on Land (15)
- Partnership for Goals (17)



## **GLIMPSE OF ACTION LEARNING FACILITY**





## OUR CAMPUSES



Jatani Campus



Parlakhemundi Campus



Rayagada Campus



Balangir Campus

# OUR PRESENCE

